INSIDE: GLOBAL EXPERTS PICK 75+ EISA AWARD WINNERS

australian hi-fi

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Hegel integrated packs power and streaming prowess

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Next-gen speakers live up to their legacy

REVIEWED

KING OF SPIN

Denon's direct-drive deck gets in the groove

MUSIC REVIEWS

Essential headphone tracks
+ all-new Bon Jovi, Crowded House and Cage the Elephant

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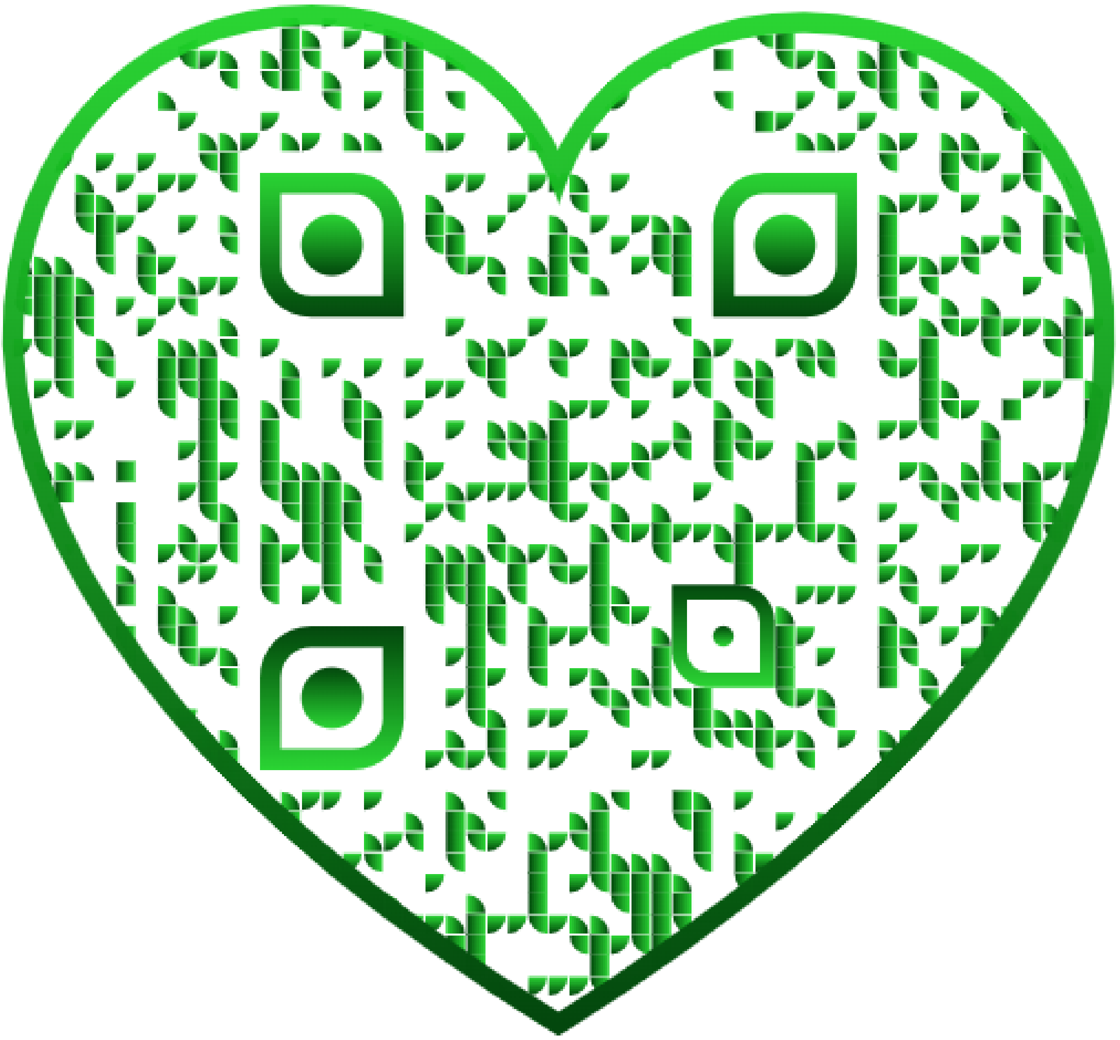

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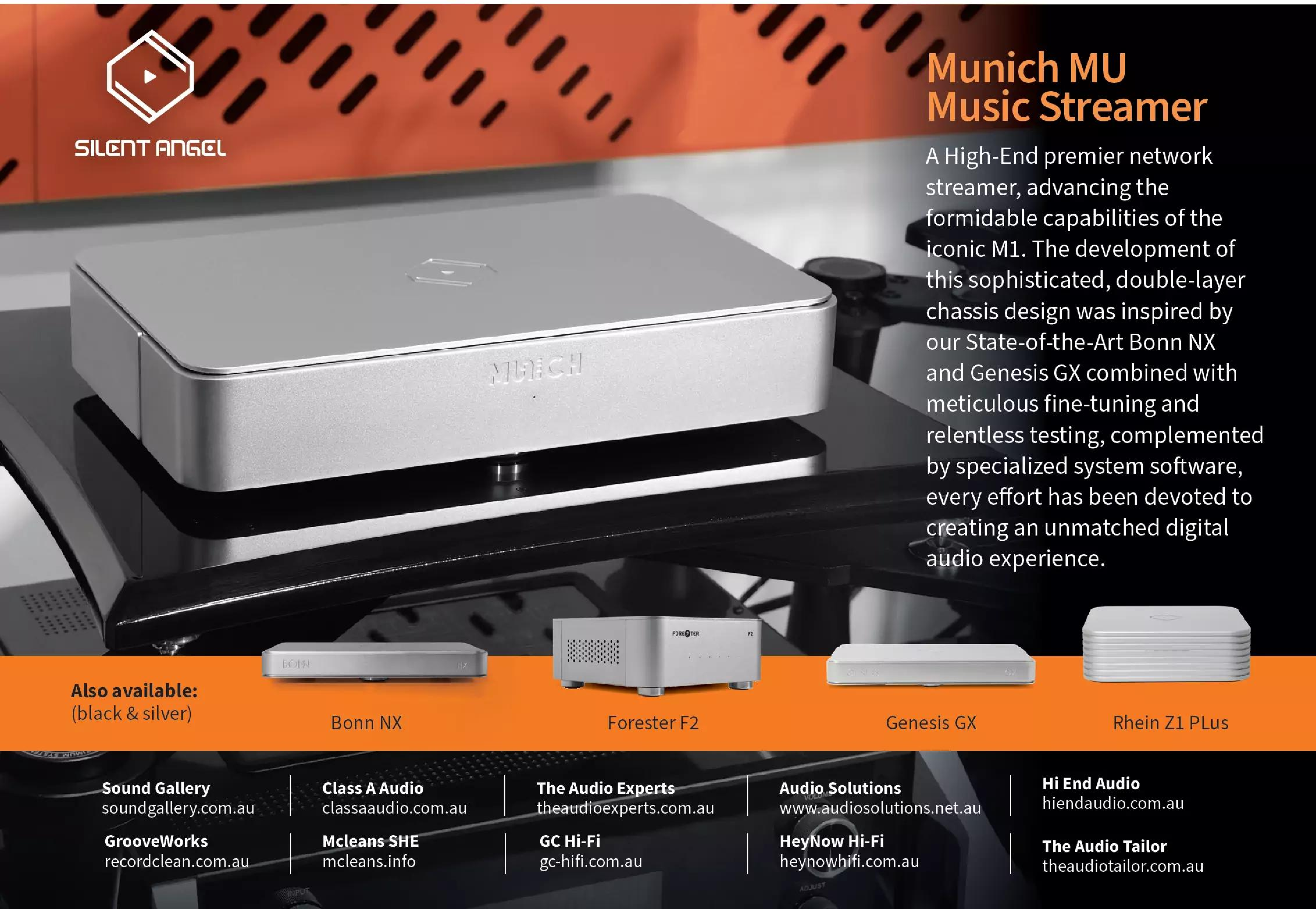

Editor's lead in

Whether it comes to us without warning as an unshakeable itch over a tormenting week or during a visit to a friend's house which has been newly furnished with an amplifier costing twice the price of your own, we hi-fi hobbyists are prone to 'upgradeitis' just as much as the common cold. The nail a former colleague hit directly on the head: "We're known for our inability to buy a system, set it up and listen to music — we have to tweak this, adjust that and constantly buy new bits and bobs." It's hardly a reputation we, as a collective, can refute. In my years of daily, 9-5 access to state-of-the-art testing facilities, I still fully exploited my opportunity to borrow (always borrow!) kit to swap in for something positively ancient… or more often than not, six months old. And, admittedly, not always because I thought it would bring real improvements, but just because it would temporarily relieve the itch.

OK, so I could do this easily and free of charge — my job is an enabler. (Thinking about it, upgradeitis is an occupational hazard and perhaps I should get some sort of workers' compensation for psychological suffering.) But anyone can replace components as often as they like if they have the cash and ~~medical condition~~ itch to. I hear a cure isn't a World Health Organization priority, so the best we can do is to try to keep it under control.

Before committing to an upgrade, not least if you've identified a weakness in your system, get to know your system inside and out and make sure it's already the best it can be. Are you using good-quality cables? Are all the connections squeaky clean and tight? Can you better position your speakers or decouple anything better using isolation materials? Such tweaks won't always make a world of difference, but their impact might surprise you.

If you're upgrading twice a year because you think that sounds about right, then congratulations on having the disposable income to do so. But hi-fi isn't a car; it doesn't have kilometres on the clock. Unless it malfunctions or something software-related renders it defunct, hi-fi doesn't *need* upgrading. Identified an area of weakness you want to strengthen? Fair enough. But your reason to upgrade should be, in a nutshell, to make a real discernible improvement to the sound… and not just a difference! The more kit you listen to, whether that is at hi-fi shows, your local dealer or your mates' homes, the more you'll be able to discern true improvements from mere differences; differences that can sometimes present themselves as seductive at first but aren't necessarily better than what you have.

There's a psychology to be aware of. Change anything in your system, whether that is introducing a whole new component or changing the positioning of something, and you're likely going to hear a difference. Try to identify the particular aspects of your system's sound that you want to improve, too, rather than go for a vague 'better performance' ideal, which runs the risk of losing the elements you liked in the first place.

A big upgrade — say, a core component jumping up a price bracket or two — every few years will likely be more worthwhile than a couple of modest upgrades along the way, and you'll save the money and faff and likely enjoy hearing the bigger-step improvement. Avoid getting sucked into the 'what ifs' and 'perhaps I shoulds' of new equipment or accessories, and live with what you've bought.

I returned from the Australian Hi-Fi Show desperate to listen to my own setup, the irony being that it is significantly inferior to many of the systems I heard there. But I was keen to play stuff I had heard for the first time and liked (Anyma's *Sentient* was one, for the record.) Instead of being down that you've heard your favourite Diana Krall track better through another system, listen to something new. Use a streaming service's artist radio feature, or tune into a playlist curated by your favourite artists, record stores or hi-fi mags. Nothing beats the thrill of discovering a new artist you like. Not even hearing a new amplifier that sounds that little bit better than your last.

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australian **hi-fi**

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Triangle Capella

Made in France, Triangle's EISA Award-winning CAPELLA wireless speakers provide a complete, intelligent audio system with unprecedented performance. Entirely configurable to suit your taste and environment, modern and connected, the system is Bluetooth and Wi-Fi compatible (AirPlay, Chromecast, UPnP/DLNA), as well as Roon Ready. The speakers communicate wirelessly using high-res WiSA technology with a Stereo Hub, a compact, remote box included with the speakers to add TV/ARC, USB, optical or analogue sources. With thrilling new finishes, CAPELLA is the wireles solution that adapts and fits your needs.

Musical Fidelity A1 Amplifier

First released back in 1985, the A1 was a hi-fi classic, using pure Class A amplification and expertly laid-out discrete symmetrical topology. Now it has been reborn by Musical Fidelity's new team, retaining the original specifications, appearance and circuits, but updated with an improved transformer, power supplies and modern low noise components. Working in dynamic Class-A, "sliding" (not "switching") into Class-B if really pushed, the revitalised A1 is proving a winner with hi-fi fans everywhere – and now an EISA award as well!

MUSICAL FIDELITY

AUDIO MARKETING

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Marathon endurance

Cambridge Audio has unveiled its debut pair of wireless over-ear headphones, and in the face of the daunting task of making their mark alongside the established heavyweight rivals from Sony, Bose, Sennheiser and the like, the Melomania P100 look like real contenders.

They offer an industry-leading 60 hours of battery life, active noise cancellation (ANC) and the same Class A/B amplification used in the company's acclaimed CX Series stereo amps.

That marathon battery life matches the Sennheiser Momentum Wireless 4 and is among the longest I've come across in the market. Turn off noise cancellation and it extends to an unmatched 100 hours. The Melomanias charge up quickly, too: just five minutes of plug time gets you two hours of playback, or four hours without ANC.

Like Cambridge Audio's other products, the Melomania P100 were designed, tuned and engineered at the firm's London HQ. They're powered by a custom 40mm three-layer Mylar driver with neodymium magnets, matched with that proven firepower from the brand's hi-fi fare. Cambridge Audio claims this produces "deep, controlled bass, realistic vocals and beautiful treble clarity".

Qualcomm's Snapdragon Sound platform with the very latest aptX Lossless Bluetooth codec is also onboard to enable "lossless" CD-quality wireless playback when connected to a compatible source (of which few are currently available). You can choose from three levels of ANC, depending on your situation, one of which is a Transparency Mode that purposely lets in sound so that you can briefly hear your surroundings.

Present and correct is Bluetooth Multipoint, which allows for simultaneous connections to two devices and is fast becoming a must-have feature in the market. A dedicated Gaming Mode — which can drop latency rates to just 80ms when connected to a source wirelessly — will appeal to gamers who want to go wire-free, too. It's also pleasing to see a choice of wired listening options catered for, courtesy of USB-C-to-3.5mm and USB-C-to-USB-C cables provided.

You can tweak tonality using the equaliser within the Melomania Connect app — either adjust it manually or choose from the six presets — and the P100 should be comfortable enough to wear for hours on end thanks to their memory foam earcup pads covered in faux leather.

The Melomania P100 are intended as flagship accompaniments to the recently launched Melomania M100 wireless *earbuds*, and thankfully also feature audible feedback voiced by Toast Of London star Matt Berry! They're made with plastic that is 50% recycled and ship in 100% recyclable plastic-free packaging. The battery and earcup pads are replaceable, too.

In black or white finishes, the Cambridge Audio Melomania P100 are available for $479.

Here's hoping the brand's experience in making great wireless earbuds pays off for this over-ear implementation.

For more information, contact BusiSoft AV on (03) 9810 2900 or visit www.busisoft.com.au

Streaming marvel, miniaturised

Lumin is typically associated with the higher echelons of the hi-fi market, but with its introduction of the P1 Mini, the Chinese company seems to be taking steps to bring its top-class streaming prowess to a wider audience. The miniature, peg-down version of its premium P1 streamer isn't what many would call 'affordable' — it retails in Australia for $7,690 — but it does point to a growing streaming market and the demand for more accessible high-quality streaming.

To that end, the P1 Mini offers extensive streaming capabilities alongside DAC and pre-amplifier functionalities, with Lumin promising engineering designed to deliver "an elite level of signal processing and versatility to the heart of every system".

While announced earlier this year at the High End Munich show, the P1 Mini is now on sale globally as Lumin looks to build on the success of its larger P1 ($14,900) by packing much of the same componentry and flexibility into a more compact chassis. Lumin is clearly going for versatility and value here.

You can wire the P1 Mini to your home network courtesy of two provided ports: a standard Ethernet port, and an optical fibre one which provides isolation from unwanted noise and is a feature that has trickled down from the company's flagship X1 steamer. It ticks all the streaming boxes you would expect it to; it's Roon Ready and hosts Spotify and Tidal Connect, Qobuz, FLAC Lossless Radio, TuneIn Radio, AirPlay 2, and multi-room via Songcast.

The dual ES9028PRO Sabre DACs' file support is, in effect, ceiling-less — up to 32-bit/384kHz PCM and DSD512. In terms of physical connections, the P1 Mini offers line-level, optical, coaxial and USB (Type B) inputs, while analogue outputs include both RCA line-level and balanced XLR.

Taking versatility to another level, the latest Lumin comes with an HDMI ARC connection, meaning you can use it as the hub for a home cinema/TV system. It supports 4K video passthrough and 2.0 PCM audio as well as HDR and Dolby Vision and, thanks to ARC, negates the need for an AV receiver: just attach the HDMI source and the P1 Mini to your TV and your audio will journey through your main speakers. Neat.

The compact unit features a bespoke new power supply, digital volume control and fully balanced analogue output stage, while those dual Sabre DACs work in conjunction with dual crystal oscillators and Lumin's FPGA clock distribution system, which again can be found in the reference X1 almost three times the price.

Control is via either the bespoke Lumin app or provided acrylic and zinc remote control, both of which offer access to playback settings, input selection, per-input volume memory and input-label customisation.

Lumin's new P1 Mini streamer is available in natural (pictured) or black anodised aluminium.

For more information, contact Audio Magic on (03) 9489 51 22 or visit www.audiomagic.com.au

Studio classics

While they aren't predated by as many as 88 iterations, Monitor Audio's new Studio 89 do by name nod to the history of the British brand's famed Studio model: the Studio 15 model was introduced in 1989 as two-way standmounts that married a glossy black finish with gold-anodised drivers.

Indeed, as you can see in the accompanying image, the new Studio 89 pay homage to that ancestor in not only name but also aesthetic. Uniquely in the current Monitor Audio speaker range, they combine a high-gloss black finish with metal cone drivers finished in gold. They certainly look the part (and they sound it too, according to my colleagues at *What Hi-Fi?* who have already had the pleasure of their company).

They're more compact than the Studio 15 of old — more in line with the dimensions of the 2018-released Studio that were less impressive to me and my colleagues — though Monitor Audio promises "scale and quality that belies [the] Studio 89's size".

The Studio 89 feature the company's latest MPD (Micro-Pleated Diaphragm) tweeter, which lies in the middle of the baffle, sandwiched between two of its current RDT (Rigid-Diaphragm Technology) mid/bass drivers. These twin driver cones comprise three ultra-thin layers — a C-CAM (ceramic-coated aluminium magnesium) outer skin, sitting over a Nomex honeycomb central core, with the underside skin made up of woven carbon fibre. The brand chose this makeup for its ideal balance between lightweightness and rigidity.

Monitor Audio says the crossovers underwent "hours of listening and part selection" by its engineering team to make the most of those drivers, while the cabinet design, with its thick (18mm) front baffle and side walls (15mm), slot ports and through-bolt bracing, has been rigidly structured to also optimise driver performance.

The Studio 89 cost $3,999 per pair, so are certainly of a calibre that warrants positioning on dedicated support. Monitor Audio has created bespoke stands ($999 per pair), with their steel top plate, die-cast aluminium base, aluminium poles and four adjustable feet (chrome-plated spikes and domed rubber feet provided) designed to optimally support the Studio 89.

For more information, contact Interdyn Brands on (03) 9426 3600 or visit www.interdyn.com.au

Fresh blood in the streaming space

Lenbrook Media Group has announced plans to launch a new music streaming service built around MQA's Airia technology in a bid to take on the likes of Tidal and Qobuz.

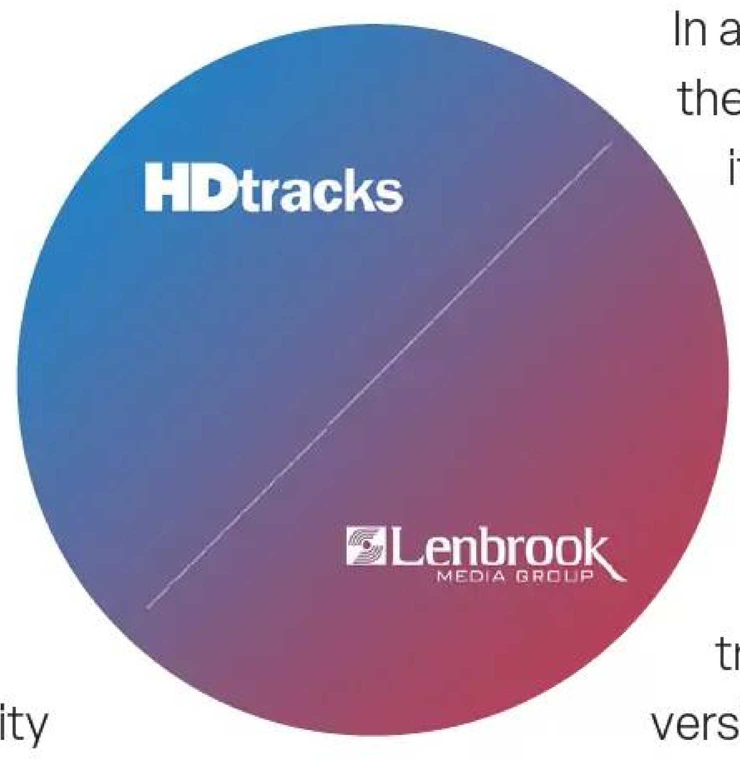
The hi-res audio specialist, which acquired MQA Ltd when it went into administration last year, recently announced the formation of MQA Labs and revealed its newly branded 'Airia' (formerly known as 'SCL6'), 'Foqus' and 'Qrono' initiatives. These include wireless streaming protocols designed to "bring audio processing enhancements across the music supply chain".

Some of these protocols are now finding their new home, with Lenbrook announcing it is partnering with digital music download store HDTracks to produce a new, yet-to-be-named music service aimed at audiophiles, using its Airia technology.

Airia is a transmission codec promising the best resolution possible regardless of bandwidth availability. Designed for low-latency wireless communications, it "brings the benefits of a format-agnostic, scalable codec with an unmatched combination of audio quality, reliability, and data efficiency," according to Lenbrook.

The service will offer users the chance to choose between listening to their music in PCM/FLAC or MQA formats, with Airia offering the delivery mechanism for transferring the files from the servers to the listener's app or device.

The box-fresh platform will be available across a variety of mediums. In addition to its bespoke mobile applications, Lenbrook plans for the service to be incorporated into "many of the world's leading high-end audio ecosystems, apps, and brands", although no concrete names have been provided just yet.



HDTracks co-founder David Chesky said: "We have wanted to launch an HDTracks streaming service for some time. In Lenbrook we have a partner with global reach to help us launch a service ensuring quality and consumer choice. Fans will get to choose their format — either PCM/FLAC or MQA — in a service that will ensure high-resolution audio streaming whether you are in your home or on-the-go."

Interestingly, Tidal, which for months offered a choice between MQA and FLAC streaming, has now scrapped its MQA library. This came some months after it first introduced FLAC tracks, which initially complemented the existing MQA offering. It has also ditched 360 Reality Audio tracks, sticking only with Dolby Atmos as its immersive audio format of choice. The changes came into effect on 24th July.

The notifying email I received from Tidal in June simply read: "On July 24 2024, we're replacing the music in Tidal's MQA catalog with FLAC versions. In addition to this change, we're removing all podcasts and music available in 360 Reality Audio."

In a supporting document explaining the upcoming changes, Tidal says it has at least 16-bit/44.1kbps FLAC versions for nearly all MQA tracks today but may not have a replacement for every single one when MQA does disappear. "We are working hard to ensure all existing MQA tracks will be replaced with a FLAC version in a timely manner," it reads.

Subscribers who have downloaded MQA tracks or albums for offline access will now need to update their Tidal app to the latest version and redownload the tracks in FLAC.

As for Sony's 360 Reality Audio format, Tidal clarifies in the same document that Dolby Atmos will be the only immersive format it supports "due to the number of compatible devices, catalog availability, and artist adoption of the format". You will see the track or album greyed out and unavailable for streaming. Sony's immersive audio format lives on in Amazon Music and Deezer.

Not just any flagship phono

If you are on the hunt for a cartridge upgrade for your high-end record player, your buying decision has just got that little bit harder (or easier), because Audio-Technica has recently launched the reference-level AT-ART1000X moving-coil design.

The Japanese company has over 60 years of experience in making turntables and related components, and the new AT-ART1000X is billed as its "most advanced cartridge to date". Quite the statement indeed.

This next-generation flagship phono succeeds the AT-ART1000, which made its debut at 2016's High End Munich show. With eight years of development since then, the new design aims to take Audio-Technica's pursuit of sonic excellence to new heights by way of "a more refined direct power system for improved efficiency and enhanced bass reproduction".

Indeed, the AT-ART1000X continues to use a direct power system whereby the dual coils are placed directly above the stylus tip, which the company claims picks up the finer details in music and delivers "unsurpassed" greater transient response. What's new is the coils — they are now rectangular rather than round, allowing for more of their surface area to be positioned in the magnetic field. Audio-Technica says this results in more efficient and improved output voltage as well as greater low-frequency range for "rich, powerful, and supremely accurate bass".

Each non-magnetic coil is constructed of PCOCC (Pure Copper by Ohno Continuous Casting) wire that is 20µm in diameter and hand-wound exactly eight times by skilled experts in Japan to create the newly developed rectangular shape. Each coil can generate 0.22mV of output voltage at 3.5 ohms, and they are placed in a tiny 0.5mm gap in the magnetic circuit.

Like its predecessor, the AT-ART1000X boasts a solid boron cantilever with a rigid aluminium housing and titanium base — all to ensure the stylus can precisely and consistently read information from the record groove and disperse any resonance that might detrimentally affect sound quality. A special coating protects the magnetic circuit from corrosion, ensuring that the cartridge continues to work and deliver the best performance throughout its lifetime.

You would certainly hope the new reference cartridge has a long lifespan, as such skill, manufacturing and sonic ambitions come with a suitably high-end price tag. The Audio-Technica AT-ART1000X is available for $6,999.

For more information, contact Technical Audio Group on (02) 9519 0900 or visit www.tag.com.au

Magical musical box

It's no secret that multi-functional components such as streaming amplifiers, which combine preamplification, power amplification, DACs, streaming modules, physical connectivity and headphone amps into one convenient box, have risen in popularity in recent years. Indeed, these just-add-speakers boxes are all the rage right now, from modest mini-boxes like the WiiM Amp Pro to more premium solutions from hi-fi stalwarts such as Naim and Cambridge Audio.

Marantz is another such brand, and its new, compact Model M1 system is being touted as a "magical musical box" — one that can be hooked up to a TV, turntable or CD player, or simply used as a gateway to streaming service playback.

The Model M1 is, like pretty much every connected Marantz and Denon streaming electronics under the Masimo parent company umbrella, equipped with the HEOS platform, which delivers a host of streaming features. Along with multi-room functionality is support for AirPlay 2, Spotify Connect, Amazon Music, Deezer, Pandora, internet radio and more. Tidal Connect and Roon Ready have now been added via an over-the-air update, too. The M1 can handle hi-res audio up to 24-bit/192kHz PCM over network and USB applications, while DSD128 playback is also supported. Bluetooth 5 brings offline streaming convenience to the menu, too.

On the amplification side, the Model M1 packs 100 watts per channel (into eight ohms), with Marantz promising super-low distortion levels from the output stage. There is the "characteristic warmth and musicality" we have come to expect from its products, too, in part thanks to the inclusion of the company's reference-grade Music Digital Filtering DSP technology. EQ, bass and treble controls allow for tonal tweakery.

Physical connections include a trio of inputs (line-level RCA, digital optical and a USB Type A), plus a subwoofer output. The icing on the cake is an HDMI eARC input for optimal TV hookup, and to that end the M1 also supports Dolby Digital+ and features a does-what-it-says-on-the-tin Dialogue Enhancer mode, a Night mode to quash dynamics when you don't want to disturb the neighbours, and a Virtual mode that uses "Dolby processing to generate a large, three-dimensional sound field from stereo-only content".

Unlike the company's full-width PM7000N and Model 40n streaming amps, the Model M1 has compact, squarish dimensions (21.7 x 24 x 8.4cm) that make it ideal for those wanting a jack-of-all-trades solution for a smaller space. Marantz is keen to emphasise that the M1 is built in the same Shirakawa Audio Works factory in Japan as its high-end hi-fi models, such as the excellent Marantz SA-10 SACD player.

The Marantz Model M1 is available now in a sleek black finish pictured above for a rather competitive retail price of $1,600. A custom-install version called the Model M4 — a dedicated rack-mountable amp that allows four independent rooms in your home to each enjoy their own music listening, driven by one install-optimised amplifier (8 x 100W) and four independent HEOS modules — has also hit the shelves, priced $5,500.

For more information, contact Masimo Australia on 1300 627466 or visit www.marantz.com

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Branching out

It's been a rather long wait, but Sonos' first headphones are here. The wireless Sonos Ace, which were originally rumoured to launch in 2021, have finally arrived with custom drivers, "lossless" Bluetooth audio, spatial audio with dynamic head tracking, and — the ace up their sleeve — in-room calibration for movies.

Let's start with the drivers. Inside each earcup is a custom-designed 40mm dynamic unit that Sonos promises "render[s] each frequency with impeccable precision and clarity". Compared to the Ace's closest rivals, those drivers are 10mm bigger than the carbon fibre ones inside the class-leading Sony WH-1000XM5, and the same size as those inside Apple's AirPods Max.

The Ace support Bluetooth 5.4, and "lossless" CD-quality audio via Qualcomm's Snapdragon Sound aptX Lossless Bluetooth codec, with aptX, AAC and SBC also supported. Wired listening is available via the USB-C-to-3.5mm cable that comes in the box. You can connect them to a laptop via USB-C, with sample rates up to 16-bit/48kHz supported.

As is expected nowadays, active noise cancellation (ANC) is onboard, along with an Aware mode to allow ambient sound in if, say, you need to chat with a colleague or cross a busy road. To this end, they are equipped with eight beamforming microphones for noise control and voice targeting.

Some Sonos fans might be disappointed to learn that the Ace are not wi-fi headphones as some had hoped — they connect to mobile devices via Bluetooth only. That means you can't connect them to the wider Sonos ecosystem or to your Era 100 speaker as many have longed for. Sonos says the team thought hard about full wi-fi implementation, but for this "entry" headphone product it focused instead on the user experience and the way in which Bluetooth is universally supported on smartphones and offers seamless integration. There actually is a wi-fi chip in the Ace, but it is only used for the TV Audio Swap and TrueCinema features. Which brings me to...

The Ace are certainly built with home cinema in mind. Support for spatial audio with Dolby Atmos delivers a more immersive experience with Atmos movie soundtracks and music mixes, while dynamic head tracking keeps the sound anchored to the screen if you look away. You can instantly swap the audio from the Sonos Arc soundbar to your Sonos Ace at the tap of a button, too, so you can cut yourself off in your own private viewing pronto. Courtesy of a recent firmware update, that is now compatible with other Sonos soundbars too — Beam Gen 2, Gen 1 and Ray.

Another new home cinema feature is TrueCinema calibration, which uses brand-new software to tailor the Ace's acoustics to your room, bringing a more spatial and immersive experience when watching Atmos soundtracks via a Sonos soundbar and TV system. The idea is to not feel like you're wearing closed-back headphones, with the sound tailored to your room the way your Arc is calibrated to your room's acoustics. It's a bit like TruePlay for Sonos speakers, then.

Battery life is a Sony XM5-matching 30 hours with ANC or Aware mode activated, and impressively you get three hours of juice from just a three-minute charge.

Their look, meanwhile, is somewhere in between their Apple and Sony rivals. Sonos stresses its use of premium, lightweight materials that supposedly give the Ace "an airy fit that gently hugs your head". The memory foam interior is wrapped in vegan leather, while the headband and earcups have been designed to seal off your ears from external noise without catching your hair.

The Ace are responsibly made, too, with replaceable ear cushions (in case they wear out) and circular materials that use 17% less virgin plastic. The travel case is made of 75% recycled felt that comes from plastic bottles, too.

Other essential headphone features include Wear Detection, which automatically pauses music when you remove the Ace (and resumes playback when you put them on), and Bluetooth Multipoint, which lets you connect to two sources simultaneously for seamless switching between, say, a phone and laptop.

The Ace come in two matte finishes — black or soft white — with the metal accents' intensity differing slightly depending on the finish. Another nice touch is that the mesh in each earcup is a different shade to more clearly distinguish between the left and right ones. They opt for proper buttons as opposed to touch controls, too; on the left earcup is a button for power and Bluetooth pairing, and on the right is a single button to cycle through the noise-cancelling modes, as well as a multi-functional slider/button (Sonos calls it the "content key") that can either be slid up and down to change volume, or pressed a couple of different ways to control playback (pause, play, skip, answer calls etc).

The Sonos Ace cost $699, putting them directly in the firing line of Bose's QuietComfort Ultra Headphones but above the Sony XM5 and AirPods Max in price.

For more information, visit Sonos at www.sonos.com

Fully featured, with French flair

French audio manufacturer Triangle is the latest hi-fi brand to jump aboard the active wireless speaker system bandwagon, aiming to outmuscle systems from the likes of KEF and Sonus faber with its new Capella speaker system. For the uninitiated, such systems integrate hi-res, wi-fi streaming into a pair of active standmounts, removing the need for separate amplifiers and music streamers, to provide users with a compact stereo hub for their music, movie and even gaming needs.

Each Capella speaker is a two-way design incorporating Triangle's signature horn-loaded tweeter with a 25mm magnesium alloy dome alongside a 16.5cm cellulose pulp membrane midrange — all powered by a total of 200W Class D amplification. Triangle's digital signal processor monitors the drivers' behaviour to optimise their performance, while a digital crossover aims for a perfectly linear frequency response.

The Capella boasts single RCA stereo, coaxial and USB Type B inputs, three optical inputs, and an HDMI ARC input for connecting the speakers to your TV as proper stereo alternatives to a soundbar.

Wi-fi facilitates UPnP streaming, AirPlay 2, Chromecast, Spotify Connect and Roon Ready, while Bluetooth can step in if your network is playing up. Unlike active wireless speaker systems like the KEF LS50 Wireless II, but akin to those from the likes of Dali, the Capella comes with a small, separate "stereo hub" which acts as the nerve centre for all its streaming powers and physical connections. The hub is a WISA transmitter and transmits audio up to 24-bit/96kHz to the speakers wirelessly.

It is a clever setup, too, with room acoustic calibration possible through the accompanying app and your smartphone's built-in microphone. Together, they can measure and analyse the room in which the speakers are set up, and then the Capella's performance can be automatically optimised accordingly for that specific space. You can manually customize the sound further in the app by directly controlling the response curve and tweaking EQ settings to your preferences. Triangle offers a rechargeable Zen microphone for more accurate measurements than your smartphone, though you should contact distributor Audio Marketing about whether you can obtain one in Australia.

As easy on the eye as any I've come across, the Triangle Capella incorporate high-density cabinets that pursue a luxury aesthetic thanks to their lacquered walnut exterior, which is available in four finishes — Black Star, Astral Blue, Space White and Brown Nebula. As for that distinct aluminium base, Triangle says the speakers have been mounted that way to offer greater airflow around the port. Naturally, the French company has designed dedicated S05 speaker stands ($600 per pair) to fit perfectly to that base.

The Triangle Capella system is available now for $5,500.

For more information, contact Audio Marketing on (02) 9882 3877 or visit www.audiomarketing.com.au

Dawn of the discman… in 2024?!

Following the release of its CP13 portable cassette player — a homage to Sony's first Walkman player from 1979, right down to its "silver-blue" two-tone finish and simple rectangular design — FiiO is continuing its throwback era with the launch of a Discman-esque portable CD player, the DM13.

It has of course been well documented that vinyl sales have seen a big resurgence in recent years, but CDs are beginning to experience a sort of renaissance too. The release of a portable player in 2024 certainly suggests that the shiny discs are making a comeback, as more and more people begin to discover (or rediscover) their love for physical music formats. So don't consign your collection to the bin just yet!

The FiiO DM13 features both single-ended 3.5mm and balanced 4.4mm headphone outputs, so it should play ball with a wide range of headphones. Dedicated analogue line, SPDIF and USB outputs allow the DM13 to integrate into your existing hi-fi setup, be used with active speakers, or be hooked up to a portable speaker's auxiliary input.

The player also includes aptX HD Bluetooth as a further touch of modernity so that it can wirelessly play through Bluetooth headphones and speakers. The DM13 plays compact discs, of course, and supports FLAC, WAV, WMA, AAC and MP3 file formats.

The DM13 is portable, with a built-in battery that supposedly lasts for up to eight hours of playback on a single charge, though if you prefer to use the player in situ you can take advantage of its dedicated desktop mode (to bypass the internal battery) and use mains power instead.

The FiiO DM13 will be available later this year in a silver finish (with additional colours such as black, red, blue and titanium to follow) and, based on its confirmed US$179 price, should retail for around $300 here in Australia.

For more information, contact Addicted to Audio on (03) 9810 2900 or visit www.addictedtoaudio.com.au

Box-ticking sequel

With the age of streaming and all the services, technologies and protocols that now come with it, there runs a risk that shopping for streaming-savvy components becomes little more than a box-checking exercise. That is where reviews come in, of course — to shed light on a product's performance and the manner in which these ticked boxes are executed — but it is still important for shoppers to first scan spec sheets for the functionality they desire, and in the case of the NAD C 700 V2's, it's likely they will find it.

NAD's follow-up to the C 700 BluOS streaming amp justifies its 'V2' evolution with an upgraded DAC and the addition of an MM phono input, Dolby Digital decoding, Dirac Live compatibility and an infrared remote control. The original C 700 was no slouch on the features front, but these worthy additions certainly make the sequel even more versatile. Big things can be expected from its performance, too, considering the original won an 'Amplifier of the Year $2000–$4000' Award from *Sound+Image*, our sister magazine in Australia, for its "big smart display, loads of streaming options thanks to the inclusion of BluOS, and of course the power for which NAD has been renowned for decades".

The ESS Sabre ES9028 DAC chip promises a "refined listening experience" with greater precision and depth, while NAD's HybridDigital UcD Class D amplification, found in many of its integrated and streaming amplifiers, is also onboard. Its white paper on the amplifier technology (https://nad.de/wp-content/uploads/2017/03/Hybrid-Digital_WhitePaper.pdf) reads: "Hypex introduced the amazing UcD concept in the early 2000s. Unlike DirectDigital, which starts with a digital signal and uses active digital processing to perform error correction, the UcD concept is a switching analogue amplifier with all parameters highly optimized to allow self-regulation. The all-discrete driver and output stages have extremely low open-loop THD as well as low idling losses, normally conflicting requirements with conventional IC driver circuitry. An added control loop incorporating an integrator with adaptive clipping enables 20dB more feedback to be used across the audio band because of its extremely low phase shift, resulting in a dramatic reduction in distortion across the audio band."

Like the original C700, the new V2 iteration will be raring to go as soon as you've plugged it in, connected a pair of speakers and hooked it up to your home network. As well as outputting in stereo, it can also switch to a 4.1 Dolby Digital Surround setup if you connect BluOS-enabled rear channels and a wired subwoofer.

That makes this all-rounder suitable for movies as much as music, as does its HDMI eARC port and Dirac Live room calibration support (note: this requires a Dirac Live licence and calibration microphone).

The MM phono input lets you enjoy your vinyl with precise RIAA equalisation and low noise, while coaxial and optical inputs accommodate additional digital sources if you want to, say, connect a CD transport. Also onboard is two-way (receiver and transmitter) aptX HD Bluetooth, and AirPlay 2. The latter offers a multi-room solution, as does its core BluOS platform, which is also a gateway to all the major hi-res streaming services including Amazon Music, Deezer, Qobuz and Tidal. Spotify Connect and Tidal Connect? Tick, tick.

Of course, you get internet radio too and access to your network-stored music; 24-bit/192KHz PCM and MQA are supported.

The C 700 V2 also plays nice with the Alexa and Siri voice assistants, and lest we forget to mention that wonderfully colourful HD display for showing album art.

For more information, contact Convoy International on (02) 9774 9900 or visit www.convoy.com.au

MONITOR AUDIO

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Listen Again.

Explore more

Old Puppy, new tricks

The original 1980s WATT/Puppy loudspeakers are, according to Wilson Audio, the world's bestselling loudspeakers above US$10,000, so it was only a matter of time before a full-blown remaster would see the light of day. That day finally came at this year's High End Munich, and now they have launched globally. The new WATT/Puppy are now available in Australia from $66,995 and have been available to demo in Sydney, with Melbourne, Brisbane and Auckland auditions starting in August.

The iconic towers' design takes inspiration from the old dogs, incorporating the same angular, hand-sculpted structure sported by the 1986 floorstanders, albeit with some rather comprehensive internal upgrades. The timelessness of the design is evident in the new model's likeness to the 1994 iteration (left) in the accompanying image.

The iconic model went through eight iterations between 1986 and 2011, embracing an ever-changing combination of materials in search of the best sound. Today's reboot is constructed with what Wilson Audio describes as the "most refined materials" possible, showcasing specially constructed internal bracing and vibration-sink and damping interface materials to create a stable, noise-free enclosure. This *SoundStage!* video explains these 'secret' materials: https://www.youtube.com/watch?v=xoHrsoOTFKw.

The idea, says the American company, was "to build a WATT/Puppy that Dave Wilson would have built if he had the resources then that Wilson Audio now has".

Each speaker uses the company's 25mm Convergent Synergy Carbon tweeter — originally developed for the Alexx V, and also integrated into the Alexia V and Sasha V; an 18cm beloved seven-inch AlNiCo (aluminium/nickel/cobalt) QuadraMag midrange driver — developed and used in the Chronosonic XVX, Alexx V, Alexia V and Sasha V; and two eight-inch bass units packing cellulose composite cone technology — another Sasha V development.

The WATT/Puppy further benefit from Wilson Audio's modern engineering techniques, such as the specially designed and "inherently inert" composite enclosures in pursuit of greater drive unit stability. Adjustable spikes allow for the precise time-domain alignment of the WATT module, which rests on spike track hardware, directly installed into the V-Material top plate, to reduce vibrations from the woofer cabinet impacting the enclosure. A bubble level integrated into the Puppy also ensures effortless levelling during the installation process.

The new iteration also uses Wilson Audio's proprietary capacitors, wound in-house to meet tight tolerances and provide greater low-level resolution, revealing "the subtle nuances of sound reproduction with remarkable clarity and depth".

Standard finish options include walnut, silver and a rather fetching spearmint coating, though colours for the cabinets, grilles and hardware can be specified by the customer.

Just so everyone who visits your house knows you own something special, the speakers' rear panels boast limited-edition medallions commemorating Wilson Audio's 50th anniversary. A unique red medallion will exclusively accompany the red paint variation, making this the rarest of them all.

For more information, contact Advance Audio on (02) 9561 0799 or visit www.advanceaudio.com.au

Early enclosures used a laminated 60lbs version of high-density fiberboard (Puppy) and Polymethyl Methacrylate (WATT).

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When this magazine's editor tells me I'm to review a piece of equipment, I tend to get a little excited. I know that I'll have my hands on it in a matter of days, but I Google it all the same.

No, not others' reviews, to the extent that they exist; there's too much groupthink in this game. I head to the manufacturer's website to spy the kit's specifications and capabilities. How will it fit with my existing equipment? What in my system will I be removing, and what will remain? How will it all be connected?

And, of course, what will it look like? Well, from the photos of the Hegel H600 integrated amplifier, I quickly formed a false impression. It looked to have one of those narrow but deep chassis. With a rated output of just over 300 watts per channel into eight ohms, an amplifier with this form factor must, I thought, be Class D.

But then the courier arrived with the box, and it turned out that I was entirely wrong.

THE EQUIPMENT

The Hegel H600 is not a lightweight Class D design. In fact, it adopts the standard 43cm width. What makes it look narrow in photographs is its considerable height (17cm) and the fact that its feet are closer to the middle of the chassis than is usual, in line with the two front-panel control knobs. Those dials are, apart from the display between them, all that occupies the front panel. There is also a power switch, but it's hidden away underneath the front of the unit (and is easy to operate without being able to see it).

The H600's 44.5cm depth requires a good amount of real estate — let's say, half a metre to allow for the rear-panel connections to have relaxed bends before heading off to other components. That support should be solid because the H600 weighs a little over 22 kilograms. No Class D amplification in there, then!

Nor, indeed, is there Class A; nor Class A/B. Hegel tells me (and the world, since it is on its website) that the power amplification is quite different, developed in-house and exclusive to the company. It's called DualAmp Technology and is worth spending a moment on.

Let's take a typical CD player output into an analogue amplifier. It has a maximum output of around two volts, and since the load of an amplifier input is typically (Hegel doesn't specify this) 47,000 ohms, the maximum current is around 43 microamps. Let's say you're pumping really loud music out of your eight-ohm loudspeakers — so loud that the peaks are hitting, say, fifty watts. At those peaks, the amplifier will be applying 20 volts to the speakers, forcing 2.5 amps of current through them.

Hegel separates those two boost functions. First, it boosts the signal to the required 20 volts, while making no demands upon it regarding current delivery. The output of the first DualAmp is then fed to the second, which supplies the current capability required to drive the low impedance of the connected loudspeakers. The point here is that each of the DualAmps is optimised for its function.

Hegel specifies the H600 at an oddly specific 303 watts per channel into eight ohms, and notes that the amplifier supports loudspeaker impedances as low as two ohms. It does not indicate whether low-impedance loudspeakers get more watts, but I suspect that if 303 watts is maintained for them, only strange loudspeakers indeed wouldn't be sufficiently served. Hegel notes that the amplification is "Dual Mono".

I'm unsure whether the separation of voltage and current amplification stages is responsible for this, but Hegel specifies something you only occasionally see: damping factor. And what you almost *never* see is the exceptional figure Hegel claims: 4,000. The damping factor is kind of the inverse of the internal resistance of the output stage. This is important, because the lower that resistance (the higher the damping

factor), the better the amplifier's control over the loudspeaker. If, say, a bass driver does not respond properly to the signal it is fed, it acts instead as a partial electrical generator, trying to pump energy back in the opposite direction. And if the resistance met by that energy is practically zero, that imposes a physical force on the driver which attempts to make it do its job properly, following the original signal.

Again, the 4,000 figure is very high as far as amplifiers go. Damping factor is always mitigated by other resistances, such as that in the speaker cable and in the speaker coil itself. This simply means that if you use extremely low-resistance speaker cable with the Hegel H600, you will be even better rewarded than you would with most other amplifiers.

One final thing on all this Class A/B etc stuff: while Hegel does not use global negative feedback to cancel out distortion, it does employ something it calls SoundEngine Technology, which is a "local error cancelling system". This, it says, allows it to combine the advantages of both Class A and Class A/B amplifier technologies while eliminating the disadvantages of each.

THE REST OF THE H600

Up until this point, I've covered only the power amplifier stage. But what about the rest? The H600 is, after all, an integrated amplifier. Despite one perhaps slightly surprising omission, the Hegel offers the full suite of modern-day integration. It sports two unbalanced (RCA) and balanced (XLR) analogue inputs apiece, plus five (!) digital audio inputs in the form of three opticals (all standard Toslink sockets) and two coaxials (one RCA, one BNC). For those latter two electrical digital connections, different input circuitry is employed.

There is also a USB Type-B socket, into which you can plug a computer, and an Ethernet network socket for streaming network audio. (We'll dig into both of these some more later.)

As for the outputs, there are, of course, decent binding posts for a single pair of loudspeakers; none of that old-fashioned A/B stuff here. Also, two sets of preamplifier outputs via RCA — one set fixed-level, the other variable, responding to the volume control. Preamp outputs naturally give you the option to upgrade the power amplification section, and aren't all that uncommon on integrated designs, but I find it difficult to imagine why you would want to do that. Perhaps it simply shows a certain modesty on Hegel's part.

There is also a digital output (again, via BNC) and with it, a rare — maybe even unique — function: a 'DAC Loop'. Enabling it within the H600's setup menus feeds the selected digital input to that BNC output, with some re-clocking to ensure signal integrity. The output can be connected to an external, presumably even higher-quality, DAC, which can then be fed via XLR back into the H600. Again, this shows an admirable modesty pertaining to the possibility of upgraded performance via external additions.

I did not take advantage of this modesty to compare alternatives. An integrated amplifier should, I believe, be considered under review in this role alone, with the possibility of future upgrades, if indeed they are possible, merely worth mentioning.

The somewhat surprising omission I referred to earlier is the absence of a phono input. That said, on a product of this nature and calibre, it probably isn't something too many will miss. That isn't to say that the H600 is unsuitable for vinyl; in fact, I did much of my listening using two different turntables. But at this price, Hegel presumably calculates (correctly in my estimation) that LP spinners will have very particular requirements for their vinyl playback and are likely to choose a dedicated phono preamp for that job anyway.

APP? WHAT APP?

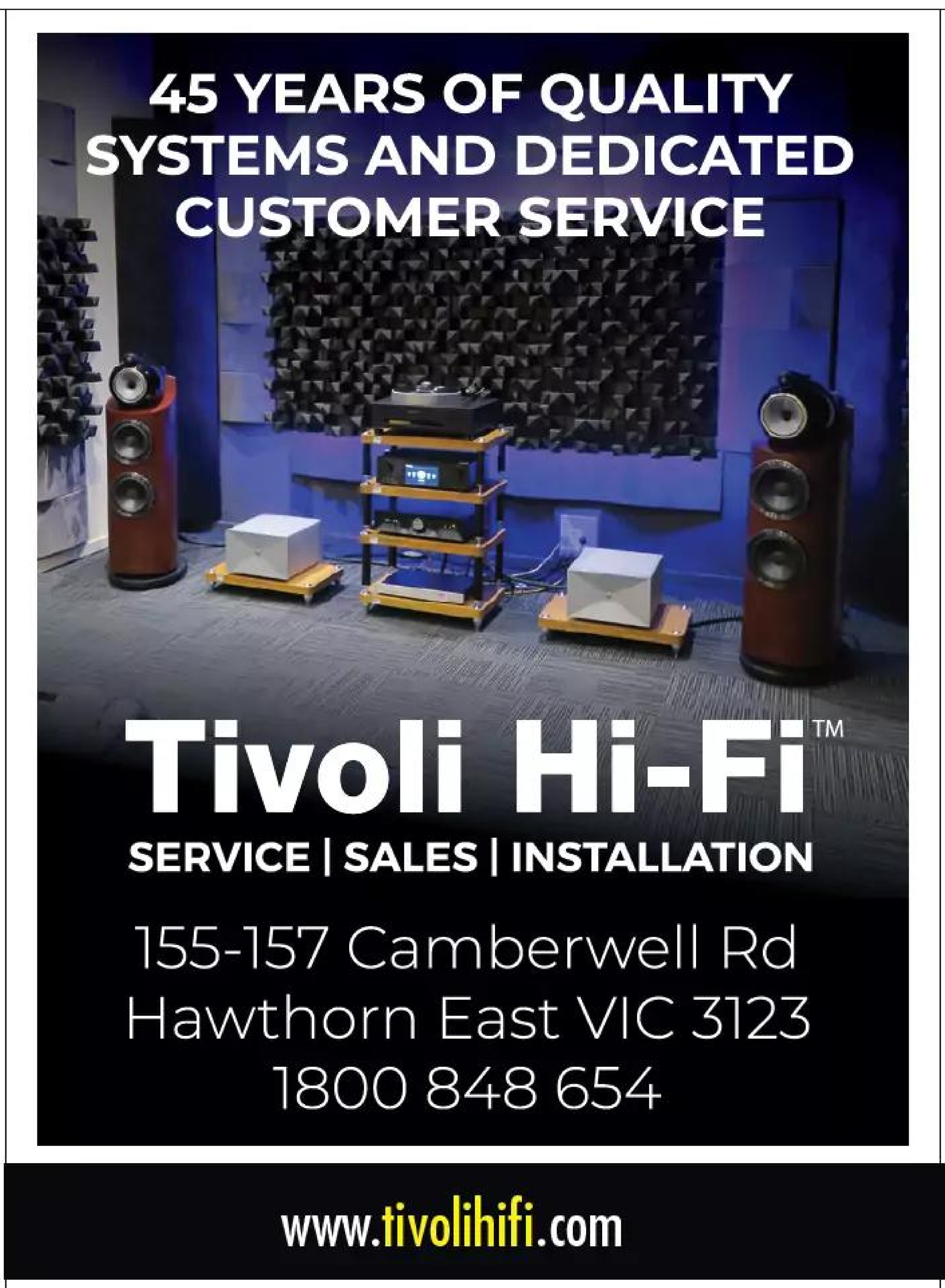
As I mentioned, the H600 has network streaming capabilities, though it can only connect to the internet over Ethernet; there is no wi-fi support. It works with Apple AirPlay, Chromecast, DLNA/uPnP, Tidal Connect and Spotify Connect. Officially, Roon Ready-ness is "pending", though as several other Hegel devices have been approved by the platform, I'd be surprised if the H600 wasn't in the near future (or even by the time you read this review).

Upon receiving the H600, I couldn't remember whether I had ever before reviewed a high-quality music streamer that doesn't come with its own app. Over the hundreds or more, I guess I must have, but none spring to mind. And you know what? It's a relief not to have yet another music app on my phone and tablet!

There is, I should say, a Hegel app, but it is purely for setup. If you're an Apple person, you will likely get away without downloading it as it serves just one unique purpose: to enable the Chromecast functionality that allows you to cast audio from some Android (and other) apps, such as YouTube and Qoboz. The app also lets you configure a static IP address, check for and install new firmware, and factory reset the unit — but you can also do all that via the unit's internal webpage, which you can launch on a web browser of any device connected to the same network as the amplifier. (Here, you can also rename the device from "H600" if you like.)

So, if the Hegel doesn't have its own dedicated streaming app, how do you access network-stored music and streaming services?

Despite one perhaps surprisingly ommission [phono], the Hegel offers the full suite of modern-day integration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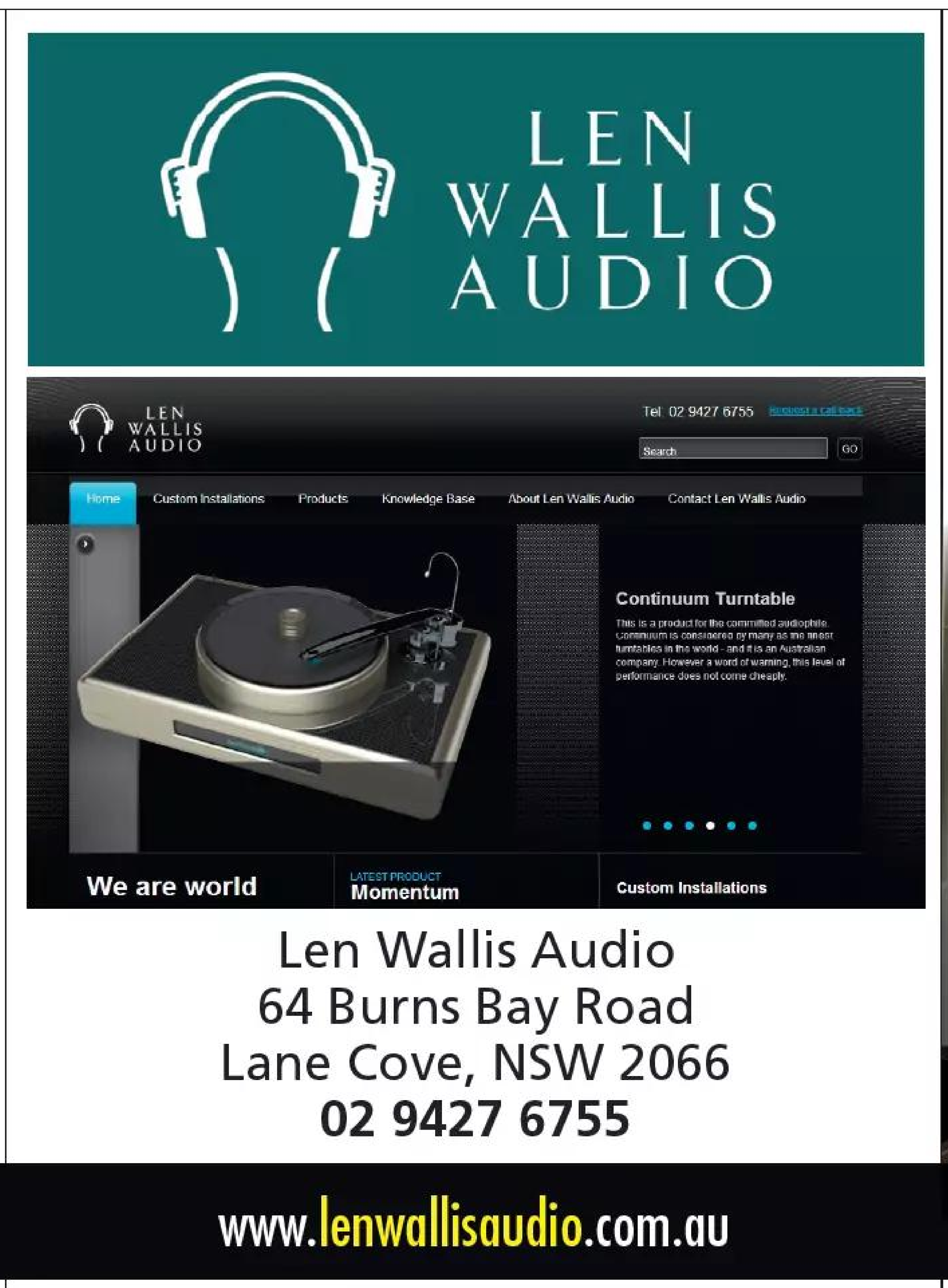
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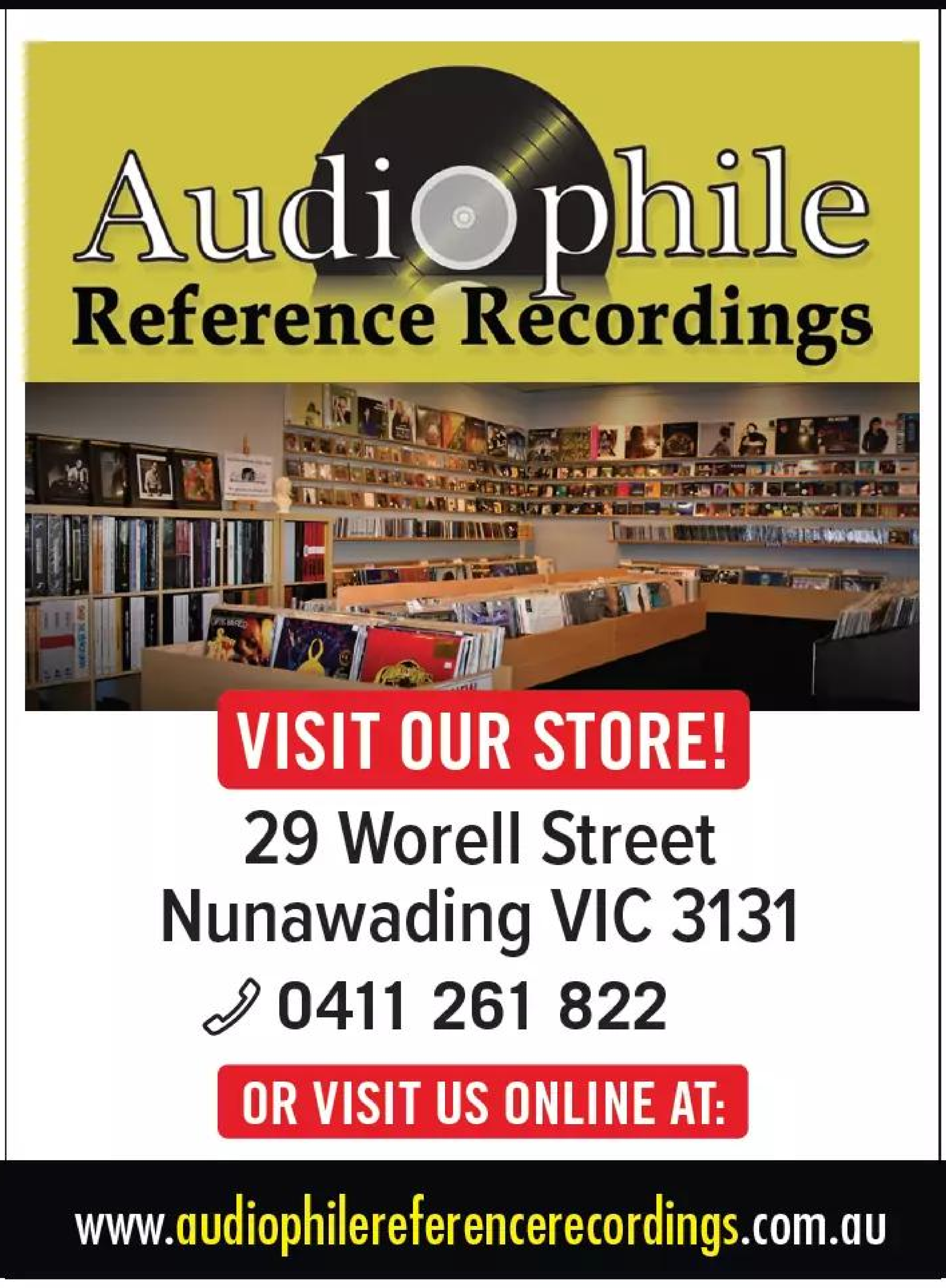
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I applaud the company for displaying the playing track's format and sampling rate on the front panel

Well, I imagine most people will simply use the Spotify app. On your phone (or other control device), open up the output speaker options within the service's app, choose the H600, and within seconds whatever song you're playing will stream to the H600 via Spotify Connect. Likewise for Tidal via Tidal Connect. I used both Connect funtions extensively during my testing; both worked perfectly.

As for streaming music from your local (device-stored) or NAS (network attached storage) resources, you can simply use your favourite streaming app. For years I have used the BubbleUPnP app on my Android devices, and this allows me to choose the H600 directly or as a Chromecast device. In the former case, I could stream my high-resolution files up to 192kHz and 'standard' DSD (DSD64). This was slightly limiting since the USB connection supports up to 384kHz PCM and 4x DSD (DSD256), although to be fair, the only audio I have above 192kHz PCM and DSD64 is purely for testing purposes. For music enjoyment, there were no limitations.

As for accessing other music streaming services, if your chosen app has a way of sending those libraries to a network connected speaker, use it. Otherwise, use Chromecast on your Android devices or AirPlay on your Apple kit.

USB AUDIO

If you do have ultra-hi-res music, the H600 can only decode it via its USB input. A little unusually, the amplifier doesn't have specific Windows drivers available, instead relying on the standard drivers built into Windows and Mac. That shouldn't be an issue for any Windows computer from the past five or so years, and for way longer than that for Macs. Indeed, when I plugged my Windows computer into the unit, the Windows Sound Devices setup reported that the H600 supports every regular PCM standard from 16-bit/44.1kHz through to 32-bit/384kHz. It's just a matter of ensuring that your playback software's settings are set to deliver bit-perfect performance. As the Hegel displays the sampling frequency on the front panel, you can then be confident those settings are right.

Since there is no custom USB driver, you can't use software that relies on ASIO (Audio Stream Input/Output, originally developed for pro-audio software). But using JRiver Media Center software, I could select the H600 using the WASAPI driver (Windows Audio Session Application Programming Interface) — it was called 'Hegel H600 USB [WASAPI]' — and all my test tracks worked perfectly. They included 24-bit/384kHz PCM tracks, as well as DSD64, DSD128 and DSD256 varieties. Also working nicely were MQA files, which were unfolded all the way up to 352.8kHz (and presumably would go to 384kHz if you had any of those). Again, the front panel showed the format in small characters: "DSD 128", "MQA 352.8", and just "176.4" for PCM, for example. A tick reveals that it has 'locked onto' the digital signal. If the MQA input is an authenticated studio file, the display is "MQA." (note the full stop) followed by the sampling rate.

I played around for a while with Tidal, but the various hi-res MQA files I knew of had been swapped out for FLAC. As I write this review, there is still MQA audio on Tidal, but it all shows 44.1kHz or 48kHz sampling, and by the time you read this, those will have been replaced too.

Incidentally, fed via S/PDIF from my Cambridge Audio CD transport, MQA CD tracks were also detected and properly dealt with. If, for whatever reason, you want to stream hi-res audio from an external device, both optical audio inputs support 192kHz sampling, despite the manual stating that they are limited to 96kHz.

WHAT'S GOING ON IN THERE?

Before we get to sound performance (I'm almost there, I promise), let's see what's happening with the digital decoding.

The user manual notes that the "DAC in the H600 is bit-perfect, meaning it will not alter the resolution or content of an incoming digital signal". The company's website expands on that a little: "a bit-perfect design, offering pure audio fidelity without any resampling or upsampling". Since no other details on the DAC are published in the documentation — is it a traditional R2R design or does it use one of the many excellent delta-sigma DAC chips? — I wanted to explore a little. First, I fed the unit a pink noise signal in 16-bit/44.1kHz, via optical, and recorded the output from the fixed-level analogue signals. I recorded it at 96kHz so that I could inspect the high-frequency performance. It was clear that a 'sharp' filter was employed. The output remained dead even to 21kHz and then dropped off as though it had hit a brick wall. Some audiophiles prefer a 'slow' filter, which rolls off the output a little earlier so that it is typically down a decibel or two by 20kHz. Me? I've never been able to put my finger on a hard and fast difference, but as sharp is technically more accurate than slow, that's what I prefer.

I then recorded an extremely sharp impulse (the source was again 16-bit/44.1kHz), and the result showed that the filter was the 'short delay' type. That produces the impulse at the start and is followed by the inevitable 'ringing', rather than that ringing being equally distributed (and at half the amplitude) before and after the impulse. Again, this should have zero effect on the sound quality, although the purist in me prefers that 'short delay' filters are not used since that more closely replicates the original analogue signal (at the point after the anti-aliasing filter is applied, but before digitisation).

SETUP

Installing the Hegal H600 is perfectly straightforward: it doesn't require any unusual accommodations apart from furniture sturdy enough to properly support its 22kg chassis. In fact, you would be adapting to an odd configuration if you felt the need to change much in the setup menu.

This menu allows you to configure things such as the automatic sleep timer (it defaults to entering standby after fifteen minutes of no signal detection), setting the default and maximum volume levels, setting the unit to recognise your TV remote's volume commands, and factory resetting the amplifier.

I didn't change any of those settings, using it, as it were, 'out of the box'.

LISTENING SESSIONS

Before undertaking any 'proper' listening for the

purpose of writing this review, I simply dwelled in the H600 for several weeks, running it as my everyday amplifier (and feeling a little guilty for exposing it to such mundane duties). It provided sound for my TV and PS5, in addition to regular music listening from CD via S/PDIF from the Cambridge Audio CXC transport; vinyl from a Technics SL-1500C turntable, using its integrated preamplifier; from the internet, using both Spotify and Tidal; and from my NAS drive, using the H600's built-in streamer. I even tried a couple of external streamers.

I formed two impressions during this period: the Hegel delivers absolutely flawless performance and is simple, straightforward and convenient to operate. Once I worked out that the 'Eco' button on the hefty metal remote control operated power/standby, everything was completely intuitive — no high-end fussiness here. As far as practicalities go, it easily matches amplifiers from the most consumer-orientated mass electronics producers.

When it was time to sit down for some serious listening, I began my sessions with another of my turntables — a Thorens TD 1600 fitted with a Goldring Ethos moving-coil cartridge. This feeds a Simaudio Moon 310LP phono preamp (via Van Den Hul interconnects), which was in turn connected to one of the XLR inputs on the H600 via Mogami Gold cables.

I ran quite a few discs, old and new. My original of Jethro Tull's 'Thick as a Brick' (it has the spoof newspaper cover and I bought it new around 1975) was delivered with glorious presence and detail through my Dynaudio Contour 20i standmounts. With a four-ohm impedance and a modest 86dB sensitivity, the speakers demand a steady diet from quality amplification, so I typically use a separate power amplifier, rated at 250 watts per channel into that impedance.

Well, it turns out that the Hegel H600 was perfectly comfortable driving my Dynaudios. Indeed, it seized control and made them do exactly what the signal demanded.

Every instrument throughout the Tull album was delivered with superb clarity and properly situated within the context of its fellows. Nothing was hidden, and nothing was isolated.

In particular, no dynamic compression was, seemingly, at play. When, moments into the first side, that first blast comes to surprise the newbie, it was delivered wholly without constraint. Gorgeous.

Should I mention this? Oh sure, why not... Inspired by that performance, I pulled out, with some trepidation, another album that is almost as old — a CBS Mastersound Half-Speed Master/'Audiophile Pressing' of Meat Loaf's 'Bat Out Of Hell'. Again, one I bought back in the day. Discogs tells me it was released in 1980.

Why the trepidation? Because this album is very fussy when it comes to playback level. At medium playback volumes, it sounds harsh and grainy, especially the backing vocals. Sadly, that was true with this system too. But here's the thing: I turned it up to play very loudly and everything fell into place. The tonal balance smoothed, the backing vocalists sounded again like a group of fine singers, rather than a poorly realised synth version, and the percussion began standing out as it should. There are boasts on the record cover — "Mastered with TLC" — and for years I've wondered why. Now, however, I see that it's all about playback level. And to get the right one, you need a highly capable amplifier.

OK, enough of the old music on old pressings. How about some *really* old music on a *new* pressing? I was first acquainted with the album 'Moanin'' by Art Blakey and the Jazz Messengers from a hi-res (24-bit/192kHz) digital copy on Blue Note (the original label), but a couple of years ago I picked up a vinyl reissue on Jazz Images. This is a remarkably clean pressing of a recording that is some two-thirds of a century old! It took at least another decade before rock recordings started being released with the fidelity of this October 1958 recording.

And being jazz and having been recorded before studio effects became ubiquitous (or in many cases, before they were even invented!), what I found myself hearing was pretty much an unadulterated feed from that long-ago, one-day recording session in Hackensack, New Jersey. Again, the control of the H600 over the Dynaudio speakers just about perfected that feed.

The second side features substantial drum solos from band leader Blakey, and again the percussion was lifted by the lack of compression in the recording, processing and, here in my listening room, delivery. The naivety of the recording was charmingly reproduced. With few microphones in use, there is a nice atmosphere in the room.

Fast forward 62 years, I come to Ólafur Arnalds's 'Some Kind of Peace', which is almost the opposite of the Blakey album, being heavily constructed in the studio and, while semi-ambient, more representative of modern recordings. Here you get the powerful, extended bass you expect from a contemporary production, along with a dancing through space of the various sound elements, each intentionally placed in a particular spot on a three-dimensional soundstage in order to complement the tone and feel of the music.

Every instrument was delivered with superb clarity... and properly situated within the context of its fellows

A transparent window into the sonics of a studio somewhere in... Iceland, I would guess, and of a studio at a time long before most readers were born. That is what the H600 offered when handed decent vinyl pressings spun on a quality turntable. And it wasn't half bad with the Technics SL-1500C either!

I've already covered the digital audio signal capabilities of the Hegel pretty extensively, so you probably won't be surprised to read that the amplifier's handling of digital files was magnificent. (Once again, I applaud the company for displaying the playing track's format and sampling rate on the front panel, not least as it allows you to easily check that your attached equipment and music playback software are properly set up.)

As for that music, let's start with CD. If you're a classical fan, you will probably find yourself underserved by most streaming services, since they only rarely carry the preferred version of any particular piece.

Of course, classical CDs tend to vary in sound quality, especially since it is often far from clear when a recording was made. That said, the rather good Karajan-conducted Beethoven Symphonies, recorded by DG in the early 1960s, stand up quite well. For this review I selected two simply excellent recordings, the first of which was a digital recording of the Royal Philharmonic Orchestra, led by Andre Previn, performing Tchaikovsky's Fifth Symphony on Telarc (a very reliable label and one of the few that makes a bass drum in a recording sound like a bass drum in a performance space).

Many people seem to enjoy symphonic music as a background to their lives, but I like to focus on, and be encompassed, by it. Thankfully, this is precisely what the Hegel H600 provided with the Previn disc when I turned it up to an appropriately loud level. The performance spread across the soundstage was exactly as it ought to be. Every instrumental section was distinct and unfurled across an appropriate area. There was a nice layering in the stage, too, and plenty of air. The rendition had dynamic punch aplenty.

After that, I simply had to pull out the famous Telarc 1812 Overture (Kunzel, Cincinnati Symphony Orchestra) with its "Caution — Digital Cannons" marker. They remain the only 1812 cannon performance that sounds just 'right' — and I have perhaps half a dozen versions. And they really are loud — so loud that they are actually substantially clipped at, I would guess, the original A/D stage, although possibly at the microphone preamp. But they still sound great, as does the big bass drum.

No, I didn't get the stomach-pulsating crunch my old system, which incorporated a 15-inch, 16Hz subwoofer, delivered — but the intensity from the somewhat sub-40Hz offered by the Dynaudio Contour 20i speakers was impressive and exceptionally tight. It was a testament to the control provided by the H600.

At the other end of the classical spectrum is chamber music, and I chose my all-time favourite performance of Schubert's String Quintet in C, featuring Pablo Casals and Paul Szabo on Cello, released on Philips. I loved this on vinyl, up until around 1990 when a certain young offspring dug channels into its surface with the turntable stylus. I eventually found a CD replacement, which is "ADD" in old CD parlance, meaning it was an analogue recording (it was 1961), digitally mixed, processed and mastered. The CD boasts of using digital noise reduction — "NoNOISE", of which I had not previously heard — to remove clicks, pops and hiss. As 1961 was probably before Dolby arrived, hiss reduction is welcome so long as the sound remains great.

And it does. Again, despite its beefy capabilities, the Hegel easily delivered every glorious subtlety of the five fine musicians on their instruments. As a live performance, it was produced with a real gusto — exuberance, even.

I shouldn't ignore modern music, although there isn't much to add. Spun on CD, Hunters & Collectors' *Talking to a Stranger* from the band's inaugural release is delivered with a manic, primitive and disturbing accuracy. (Note that I have here the remastered version of the self-titled album, as the first release was simply unlistenable. That said, the newer version is still rather too bright.) The grind of the bass guitar and manic rhythm guitar filled the room with the precision required to communicate the full intensity of the track.

Streaming music was delivered equally well. I used Spotify, AirPlay and Chromecast enough to check that they worked well and reliably, but otherwise spent all my streaming time with Tidal's library and my own extensive collection on my NAS drive (which includes many hi-res FLAC tracks, along with standard DSD).

Within the network limitations of the H600 (24-bit/ 192kHz PCM and DSD64 max), the performance was unimpeachable. On my NAS drive, a track such as King Crimson's *We'll Let You*

Know from 'Starless and Bible Black', originating from a rip I performed on the 2011 DVD Audio remaster of the album, was almost stunningly powerful in delivery. This piece starts ultra-minimalist and works its way through percussion to tonal instruments, before finally ending on a sketch of a song. It appeared in my room full of vigour and extreme richness in every tone, with an impressive amount of space between each note keeping everything coherent and perfectly listenable from start to finish.

In the 1980s I owned a pair of Magnat loudspeakers that sounded excessively bright but stunningly *there*. Later, they were reviewed in these very pages, long before I was writing for them, and the reviewer noticed the same stark presence. Even though the loudspeakers didn't produce a nice flat frequency response, their delivery had something special. The reviewer used some form of test (I wish I could now remember precisely what it was) that measured how well the speaker was damped. Did it stop when the signal stopped, or did it carry on? It wouldn't require much 'carry on' to smear detail and obscure air. On this front alone, the Magnat model was the best he had ever measured.

That is what I felt with my Dynaudio loudspeakers under the command of the Hegal H600 amplifier; they produced nothing more (or indeed less) than what the signal contained. Some of that was quietness and even silence. The H600 commanded the speakers to produce that stillness, and they could do nothing but obey.

As for private listening through headphones, well, you will need to connect a headphone amplifier of sorts for that, as the Hegel doesn't have a headphone amplifier and output of its own. Perhaps the preamplifier outputs are provided to allow owners to attach a high-end headphone amplifier of their choice.

CONCLUSION

The Hegel H600 is not just integrated, it is complete — not just in performance terms but when it comes to all reasonable features and usability too. I find it difficult to imagine speakers it couldn't drive to their potential, and sources it wouldn't do justice. Here you have a performer that is just about as good as they get.

Consider me highly impressed.

Stephen Dawson

TECH SPECS & CONTACT

Brand: Hegel
Model: H600
RRP: $19,995
Warranty: Five years
Inputs: 2 x stereo analogue audio (RCA), 2 x balanced stereo analogue audio (XLR), 2 x coaxial digital audio (1 x RCA, 1 x BNC), 3 x optical digital audio (Toslink), 1 x USB Audio (USB Type-B), 1 x Ethernet
Outputs: Stereo speaker outputs, 1 x coaxial digital audio (BNC), 1 x stereo analogue audio pre-out (RCA), 1 x stereo analogue audio record out (fixed-level RCA)
Power output: 2 x 303W @ 8 ohms
Damping factor: > 4000
Distortion: < 0.005% @ 1kHz/50W/8 ohms
Accessories: Remote control, batteries, power cable, manual
Dimensions (HWD): 17.1 x 43 x 44.5cm
Weight: 22.15kg

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Advance Paris X-P700 & X-A220 EVO

Preamplifier & Mono Power Amplifiers

- Super-classy
- Impressive sound
- Innovative circuitry

- Meters aren't crisply drawn

RRP **$2,299 + $2,900 (each)**

If you love large power output level meters, you're going to love the one inset into the beautiful glossy black methacrylate front panel of the Advance Paris X-A220 mono power amplifier, because it's by far and away the largest one I've ever seen. And as it's a mono design, you'll need two of them for stereo — so that's two super-huge meters to love.

You will have no problem seeing the meters either as they're bright — very bright. In fact, they might even be too bright, even at their 'Normal' brightness setting, so luckily there is also an 'Off' setting that allows the meters to almost disappear. I say 'almost' because you will still be able to see the red indicator needles dancing in concert with the changes in the volume of whatever music you're listening to; you just won't know what those volume levels actually are in terms of watts or decibels, about which more later...

X-A220 EVO MONO POWER AMPLIFIER

As its name might suggest, the X-A220 is rated with a power output of 220 watts into eight ohms. However, whereas one might imagine the power output into four ohms would double (or nearly double) in accordance with Ohm's law, Advance Paris rates the X-A220's output into the halved impedance as just 350 watts. This, in turn, might leave you to wonder whether the output stage is Class D. It is not. The X-A220's output stage is conventional analogue Class A/B, albeit not quite so conventional as you can adjust the bias of the output transistors.

The output transistors Advance Paris currently uses are NJW0281G/NJW0302G complementary types made by On

Semiconductor. They are lower-powered versions of the company's NJW3281G and NJW1302G output transistors, but what they lack in power output they more than make up for in their superior gain, linearity and increased safe operating area performance. The transistor pairs are also gain-matched to within 10% from 50 milliamps up to three amps. They are rated for 15-amp operation and the X-A220 uses three pairs of them in its output stage.

Understanding why you might want to adjust the bias of the output transistors is relatively straightforward. In order to reproduce a sinusoidal (audio) waveform, an amplifier designer can choose between three different types of output stage. The first is a 'Class A' type, where a single transistor handles the entire 360-degree cycle of the sinusoidal waveform. The second is a 'Class B' type, which has two transistors. The first 180 degrees is handled by the first transistor, which then switches off and hands over to the other one so it can handle the remaining 180 degrees of the sinusoidal cycle.

Class A designs provide superior performance but are very expensive to manufacture, operate at extremely high temperatures and consume enormous amounts of mains power, even when they're not playing music. Class B designs, meanwhile, are cost-effective to build, operate at reasonable temperatures, are cheap to run and can deliver extremely high power output levels, but their performance is relatively poor due to the constant switching of the audio signal between the two transistors.

The third amp type, Class A/B, also has two transistors, but instead of each one conducting for only 180 degrees, they both conduct for more than this, 'sharing' a part of the waveform. The amount of waveform that is 'shared' is dictated by what amplifier designers call 'bias voltage'. The higher that voltage, the more 'Class A-like' the performance... but also the more mains power the amplifier consumes and the hotter it runs.

Advance Paris gives virtually no operational information about the X-A220 Evo's adjustable bias circuit, saying only: "By switching the High Bias mode in ON mode, the sound is comparable to that of a Class A amplifier on the first watts of use. In this mode, the temperature of your amplifier will be important... also it's important that there should be enough clear space around the amplifier to permit a free flow of air."

Guessing that owners will likely leave the amplifier in one or the other of the two modes, Advance Paris has positioned the bias adjustment slider switch on the rear panel. Alongside it is a three-position slider switch for

... the amps did not add any extraneous noise... when the sound fades to silence, that silence is complete

front-panel meter brightness ('Off', 'Normal', 'Bright'). Since switching display brightness is something owners are more likely to do more frequently, I think placing the switch on the front panel would have been more appropriate, but I guess that would've ruined the look of that gorgeous expanse of glossy black methacrylate.

To the left of these switches are DC trigger inputs and outputs for remote on/off switching, while to the right are unbalanced (RCA) and balanced (XLR) input terminals along with a small toggle switch for selecting which one you want to use. The speaker output terminals, of which there is a single set, are gold-plated multi-way types.

Rather unusually, two blue LEDs sit on the rear panel just above the IEC three-pin mains socket, one of which glows depending on whether the amp is connected to 120V or 240V power. These appear rather pointless to me, adding to circuit complexity and manufacturing costs for seemingly no useful purpose.

Internally, the X-A220 Evo uses multiple dedicated printed circuit boards located on either side of a central heatsink. The single 700VA

toroidal transformer's output voltage is first bridge rectified, after which it is smoothed by four 10,000µF/80V capacitors.

X-P700 DUAL MONO PREAMPLIFIER

Advance Paris' publicity for the X-A220 Evo says that the best preamplifier to use with it is the company's X-P500, so if you're wondering why it is here paired with an X-P700 instead, I should tell you that the X-P500 is no longer available; it has indeed been replaced by the X-P700. From this and other discrepancies I noted, it seems to me as though no-one is regularly checking the accuracy of the information on the company's website. By way of example, at the time of writing, the specifications for the X-A220 Evo included one for channel separation!

Such informational discrepancies interfered with my understanding quite a few times whilst preparing this review, not least when it came to trying to explain to you the X-P700's two completely different operating modes, which Advance Paris refers to as 'Class A' and 'Discrete'. Advance Paris says of these modes: "Supreme refinement, it is possible to choose between two output schemes: the Class A mode using bipolars in double cascade assembly, close to a tube gradient, and the discrete mode, based on a JFET differential and current mirror in the bipolar, polarized in Class AB, more traditional."

This description appears to have suffered in translation, but I assume the gist of it is that if you prefer a softer, 'valve' sound, you should use the 'Class A' mode; if you prefer a conventional solid-state sound, you should use the 'Discrete' mode.

All I can really say here to try to inject some clarity into this statement is that no valves are involved: both modes use transistors — bipolar junction transistors (BJTs) in the 'Class A' mode and junction field effect transistors (JFETs) in the 'Discrete' mode. These two different transistor types have a variety of operational differences involving input impedance and thermal stability (both low for BJT, high for JFET) and gain (the opposite), but the primary difference is that a BJT's output is controlled by current whereas a JFET's output is controlled by voltage.

Ultimately, I'd suggest ignoring the technical differences and instead concentrating on the audible differences: listen to music using one mode, then to the same music using the other mode, and henceforth use whichever mode you think sounds the best!

As with many modern preamplifiers, the X-P700 is more than just a preamplifier; it has a DAC built-in, plus you can connect it to your computer via USB, or to an external drive. On the analogue side, the X-P700 has seven line-level unbalanced inputs (via RCA), one line-level

BEHIND ADVANCE PARIS

The brand name rather gives it away, doesn't it? Yes, as you'd expect, Advance Paris is a French company based in Paris, which is where it says all the design and development of its products takes place. However, as with most hi-fi equipment manufacturers these days, its products are not necessarily made in France, or indeed in Europe. The company says: "The final assembly of components is carried out in several worldwide plants, under the constant supervision of our engineers to guarantee the fairest possible retail price. This method of control enables us to be on offer and approved in the majority of countries worldwide."

The company actually started its life under the name Advance Acoustic in 1995, at which time it was based in Toulouse and had only loudspeakers in its range. "The starting idea was both simple and audacious: to design sound equipment, reasonably priced but with faultless musical quality," said the company. It was successful in doing this, to the point where one of its models was acclaimed for offering "best value for money" by one French hi-fi magazine.

Advance Acoustic introduced its first electronic component, an integrated amplifier, in 2003, and its success was such that the company decided firstly to export its products to countries beyond France's borders; secondly to introduce a complete line of audio and AV components; and thirdly to use the name 'Advance Paris' as both a brand and a company name.

The CEO of Advance Paris is Dimitri Peucelle, who was previously at Citroen and joined Dyson as the president for France, Italy and Spain. He is also the CEO of Istorles Group, a private group of entrepreneur-investors of which Advance Paris is a subsidiary. In its words, the company "specialises in takeovers of businesses involved in the production of consumer goods".

The managing director of Advance Paris is Jean Béchard, who used to own France Video Son (FVS), an information technology and services company offering commercial audiovisual solutions.

As you might expect from the name, Advance Paris is indeed based very near Paris (between Roissy Charles De Gaulle and Orly airports!) at 13 Rue Du Coq Gaulois, 77170 Brie-Comte-Robert, just a 10-minute walk from Brie-Comte-Robert castle, which was built around 1160.

balanced input (via XLR) and one unbalanced phono input that can be switched for moving-magnet or moving-coil operation. Although there is no impedance selector for moving-coil operation, you can adjust the capacitance for both cartridge types (between 100pF, 200pF and 320pF)… though this will affect the performance only of MM cartridges, not MC types.

On the digital side, there are the options already mentioned, as well as two optical inputs (via Toslink) — Advance Paris claims three! — and a coaxial input (RCA). The DAC that decodes the digital streams is a Burr Brown PCM1796. This is a 24-bit/192kHz converter with an 8x oversampling digital filter that Burr Brown specs says has a dynamic range of 123dB, THD+N of 0.0005%, stop-band attenuation of –98dB and a pass-band ripple of just ±0.0002 dB. Although this DAC chip has options to allow digital de-emphasis to be enabled or not, and the digital filter roll off to be switched between 'sharp' and 'slow', these functions are not available on the X-P700.

Additionally, you can gift the X-P700 Bluetooth functionality by purchashing an Advance Paris X-FTB01 Bluetooth aptX/AAC wireless receiver and connecting it into the dedicated socket on the rear panel.

As far as outputs are concerned, the X-P700 has both unbalanced (RCA) and balanced (XLR) outputs. In fact, there are *two* unbalanced outputs, one of which is full-range while the other is controlled by a high-pass filter that's switchable between 75Hz and 150Hz, which will take the pressure off both your power amplifier and your loudspeakers if you are using a powered subwoofer (or two — the X-P700 has two line-level subwoofer outputs).

As you can see in the image on the following page, the X-P700 has two headphone sockets on its front panel: one standard 6.35mm phone jack and one 3.5mm mini phone jack. You can adjust their gain independently by 10dB using two slider switches on the rear panel that have positions marked +6dB, 0dB, and –4dB. You can also adjust the output impedance of each of the headphone circuits, and Advance Paris says you have the choice between zero and 100 ohms. The output impedance is not actually zero ohms, just very close to it, but many manufacturers now use the 'zero ohm' claim in their marketing, so I guess we can't point the finger at Advance Paris for joining in.

The manual says to use the zero-ohm setting 'when connecting headphones with a low impedance 32Ω', and the 100-ohm setting 'when connecting headphones with a middle or high impedance 600Ω'. Printing the words 'Low' and 'High' alongside the switch settings would have been a better option, but the good news is that a mismatch between your headphones' actual impedance and whatever you have set on the X-P700 will not result in any damage to either component — just differences in volume and quality.

Internally, the Advance Paris X-P700 appears to be largely a dual mono design, with the two transformers powering the analogue channels separately, with another winding on each for the digital section. The most notable feature is the electrolytic capacitor count, which seems unusually high.

REMOTE CONTROL

The remote provided with the X-P700 is very useful, as it gives you not only control over volume and input selection but also instant access to other features that can be accessed directly from the multi-function control on the front panel but not nearly so easily. These functions include adjustments to bass (up/down), treble (up/down), channel balance (the manual incorrectly describes this button's function), display brightness and tone control bypass.

What you can do via the front panel control but not the remote is set the X-P700's automated power saving mode, which switches the preamplifier to standby if half an hour passes without it detecting an audio signal. Advance Paris calls this mode 'Automatic Power Down', but on the front-panel display is just the initials 'APD'.

The other function you can't do with the remote is select between the X-P700's two operating modes — 'Class A' and 'Discrete'.

IN USE AND LISTENING SESSIONS

I guess it's time to explain my comment in the introduction that the meters — lovely though they are! — will not indicate actual volume levels in terms of watts, or indeed decibels. Firstly, they can't do this because they will only ever indicate accurately when the impedance of the loudspeaker connected to it is exactly eight ohms at every frequency between 20Hz and 20kHz, and there is only a handful of loudspeakers on the market that do this — most speakers vary wildly in impedance so they may be anywhere from around three to 64 ohms depending on frequency.

Then there's the fact that the meter fitted to the X-A220 shows 'Peak' values, not 'VU' (Volume Unit) values, so even if the impedance *was* eight ohms, the meter would show a higher value than it should. My rough calculation was that the meters on my review sample showed around four times the actual value. However, now that I've pointed this out, I must say that the above information is true for *all* output power meters on amplifiers. The only other issue I had with the meters is that the letters, numbers and lines on them didn't seem to be as sharply drawn as I have seen on other meter designs.

After experimenting with settings, I decided to conduct my listening sessions with the X-P700 in its 'Discrete' mode and the X-A220 in its 'High Bias' mode, but I should say that I thought the sonic differences between the modes were sufficiently slight that I'd happily listen using other combinations. In summer, I would likely switch the X-A220 to standard bias just to keep things cool in the listening room — it gets pretty hot in the 'High Bias' mode, so ensure there is plenty of ventilation.

Listening to Gracie Abrams' album 'Good Riddance', I was impressed by the way the Advance Paris pre/power trio delivered the emotional content of the confessional nature of the lyrics, whilst simultaneously delivering the purity of the finger-picked acoustic guitar sound, the depth of the bass and the overall atmospherics. *Full Machine* is far from the album's best track, but sonically it's a masterpiece that the Advance Paris partnership was able to reproduce in my listening room to perfection. Aaron Dessner has done a superb job producing this album (as well as co-writing every song and playing seventeen instruments across them, including an ophicleide, an instrument I'd never heard of previously, much less actually 'heard').

The Advance Paris kit also delivered the spooky atmospherics of 'Love in Exile', the debut album (as a trio) from Arooj Aftab, Vijay Iyer, and Shahzad Ismaily. The sound of Iyer's piano is

brilliantly rendered, as is the sound of Ismaily's bass (and Moog), but it's the hypnotic vocals from Aftab that steal the show. The nature of the music gave me multiple opportunities to hear that the amplifiers did not add any extraneous noise to the music. When the sound fades to silence, that silence is complete, which in this case is essential to the mystery of the musicians' collective sonic soundscape (best demonstrated in the opener *To Remain/To Return*, but also a feature of *Haseen Thi).*

I loved the movie and I love the album — yep, 'Barbie The Album' is a whole lot of fun, particularly if you skip the opener *Pink* (Lizzo) and fire up Duo Lipa's *Dance The Night*, which is destined to become a disco classic. I turned up the volume on *Barbie World*, and the Advance Paris trio delivered the track's depth-charge-like bass with perfect pulse... performance perfection that was then reprised on *Speed Drive.* Channel separation and stereo imaging were demonstrated to be in abundance on *Watati*, while Dominic Fike's voice was delivered accurately on *Hey Blondie*. Female vocals were demonstrated perfectly with Billie Eilish's *What Was I Made For?*, too.

Since I've mentioned skipping openers, one opener you shouldn't skip is Kelly Clarkson's on her wonderful tenth album 'Chemistry' (even though the track is actually titled *skip this part*!) But it's the second track (*mine*) that is the album highlight, and you'll hear why when listening to it using the Advance Paris trio. The brushed cymbals are silky-smooth, the cymbal taps are precise, Clarkson's voice sounds fantastic, and Erick Serna's bass guitar is the perfect complement to Garrett Ray's drum kit. If you're sampling the sounds on this album, don't miss the sound of Steve Martin's banjo on *i hate love*; it's a classic.

CONCLUSION

The Advance Paris X-P700 preamplifier and pair of X-A220 Evo mono power amplifiers performed brilliantly well together throughout my listening sessions and with all the different sources I tried, both analogue and digital.

Super-sized VU meters, a plethora of connections and a wonderful performance — *merci beaucoup*, Advance Paris! ***Dean Shopes***

CONTACT
Brand: Advance Paris
Model: X-P700 Preamp & X-A220
RRP: $2,299 & $2,900 (each)
Warranty: Three years
Distributor: Synergy Audio Visual
Address: 107 Northern Road
Heidelberg West VIC 3081
T: (03) 9459 7474
W: www.synergyaudio.com

Laboratory Test Report

Readers interested in a full technical appraisal of the performance of the Advance Paris X-P700 preamplifier and both X-A220 Evo mono power amplifiers should continue on and read the LABORATORY TEST REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

It's important to note that these test results by *Newport Test Labs* were obtained when the Advance Paris X-P700 preamplifier and both X-A220 Evo mono power amplifiers were in-circuit, so they cannot be compared with the specifications provided by Advance Paris, which it acquired when testing the components individually.

Newport Test Labs measured the X-A220 Evo's power output at 1kHz as 270 watts into eight ohms and 445 watts into four ohms. Although easily above Advance Paris' specifications for these loads, they are not that far above them, as the 270-watt and 445-watt results are only 0.9dB and 1.1dB higher than the specification respectively. Still, you are getting all the power you paid for (and more), plus this above-spec power is also available even at the frequency extremes, which is not always the case.

Harmonic distortion at 1kHz at a one-watt output was low, as you can see from Graph 1, which shows just a single harmonically related component (second harmonic) at –102dB (0.00079%). There is, however, a non-related distortion component up at around 11kHz. This proved to be issuing from the preamplifier, as the noise floor of the power amplifier, when tested on its own, was completely clean (Graph 8). It's not really of any consequence, because the signal is so high in frequency and low in level (–95dB) that it would not be audible, but it would be better if it were not there.

The same signal is also visible on Graph 2, which shows performance at one watt into a four-ohm load. You can see that the second harmonic is slightly higher in level than into eight ohms, and has been joined by a third harmonic distortion component at –102dB (0.00079%).

Increasing power output to 20 watts saw inevitable increases in distortion levels and the addition of extra harmonically related distortion

Advance Paris X-A220 Evo Mono Power Amplifier – Power Output

Channel	Load (Ω)	20Hz (watts)	20Hz (dBW)	1kHz (watts)	1kHz (dBW)	20kHz (watts)	20kHz (dBW)
1	8 Ω	242	23.8	270	24.3	257	24.0
2	4Ω	418	26.2	445	26.5	396	25.9

Note: Figures in the dBW column represent output level in decibels referred to a one-watt output.

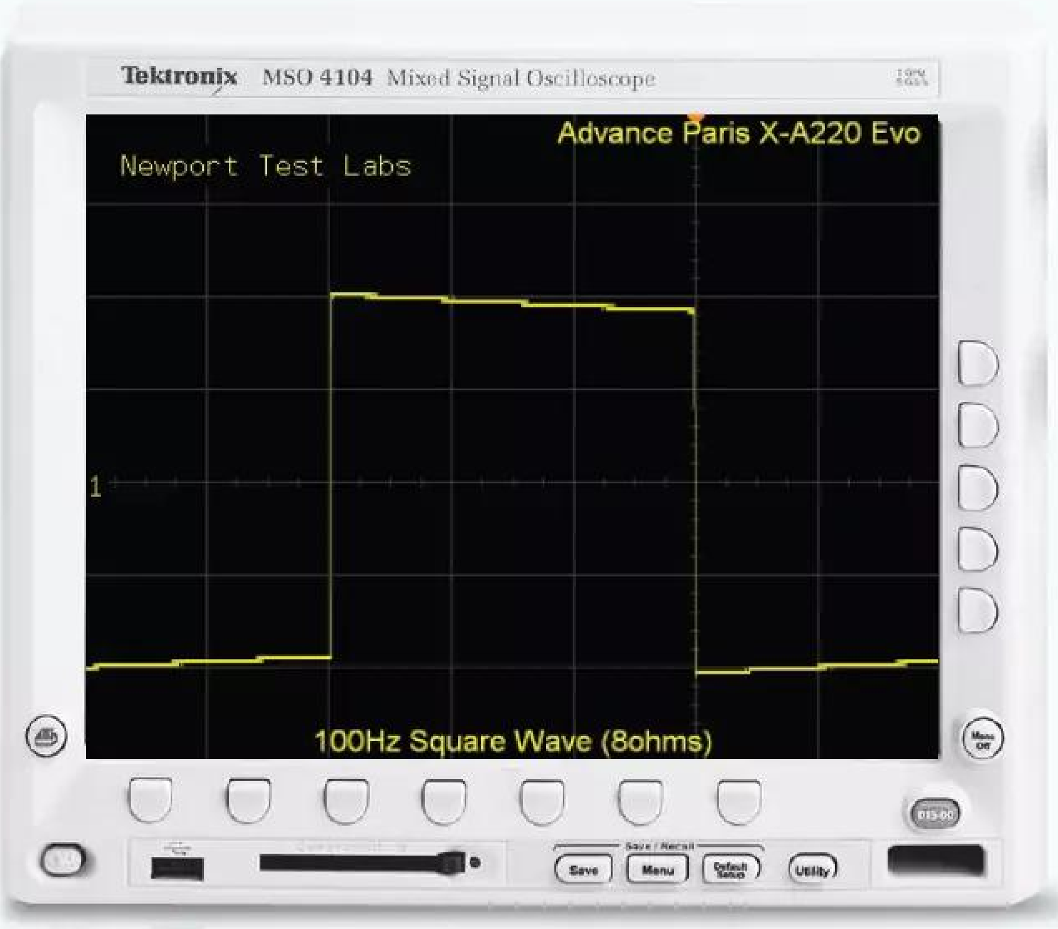
Advance Paris X-P700 Pre & X-A220 Evo Power – Laboratory Test Results

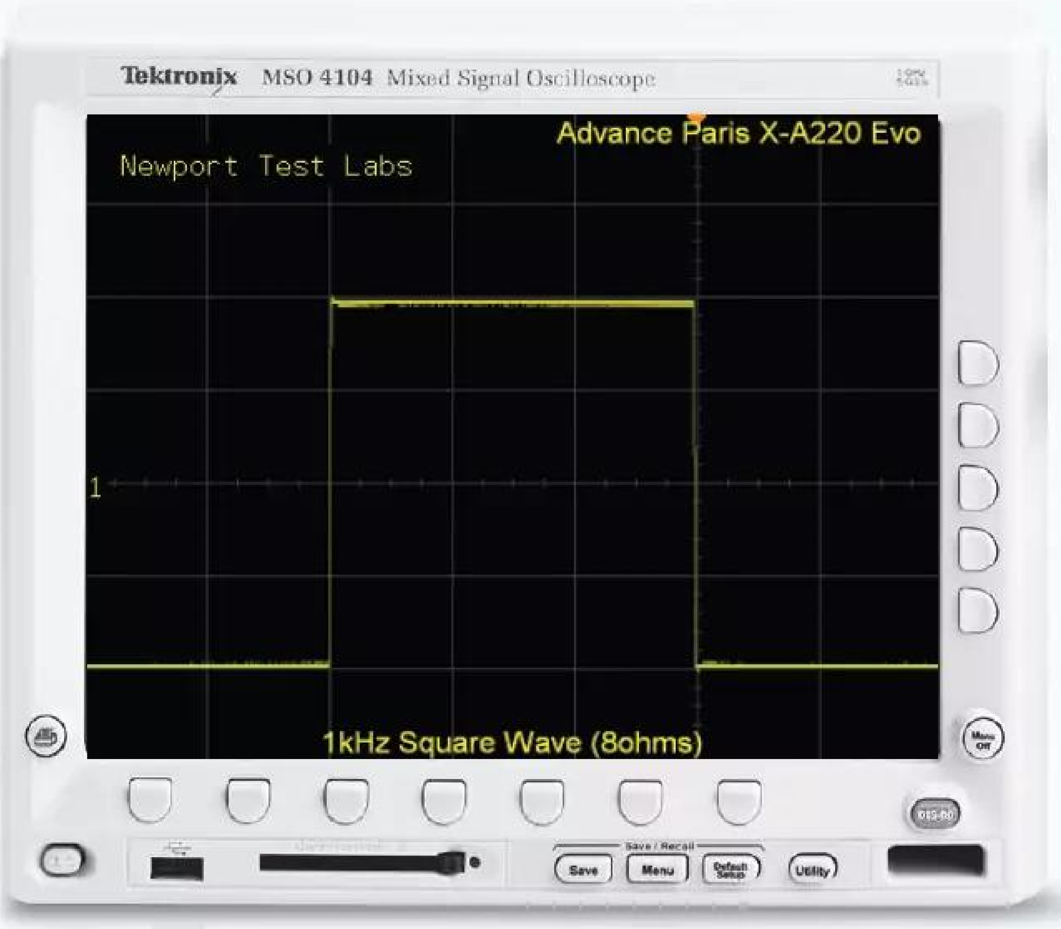
Test	Measured Result	Units/Comment
Frequency Response @ 1 watt o/p	9Hz – 100kHz	–1dB
Frequency Response @ 1 watt o/p	4.5Hz – 160kHz	–3dB
Channel Separation (dB)	106dB / 114dB / 97dB	(20Hz / 1kHz / 20kHz)
Channel Balance (Direct/Tone)	0.062	dB @ 1kHz
Interchannel Phase (Direct)	0.07 / 0.06 / 1.16	degrees (20Hz / 1kHz / 20kHz)
THD+N	0.03%	@ 1 watt
Signal-to-Noise (unwghted/wghted)	68dB / 74dB	dB referred to 1-watt output
Signal-to-Noise (unwghted/wghted)	87dB / 92dB	dB referred to rated output
Input Sensitivity	90mV / 1.31V	(1 watt / rated output)
Output Impedance	0.03Ω	at 1kHz
Damping Factor	266	@1kHz
Power Consumption	0.62 / 106	watts (Standby / On)
Power Consumption	107 / 411	watts at 1 watt / rated output
Signal-to-Noise (power amplifier only)	83dB/107dB	re 1w/re rated o/p (both weighted)

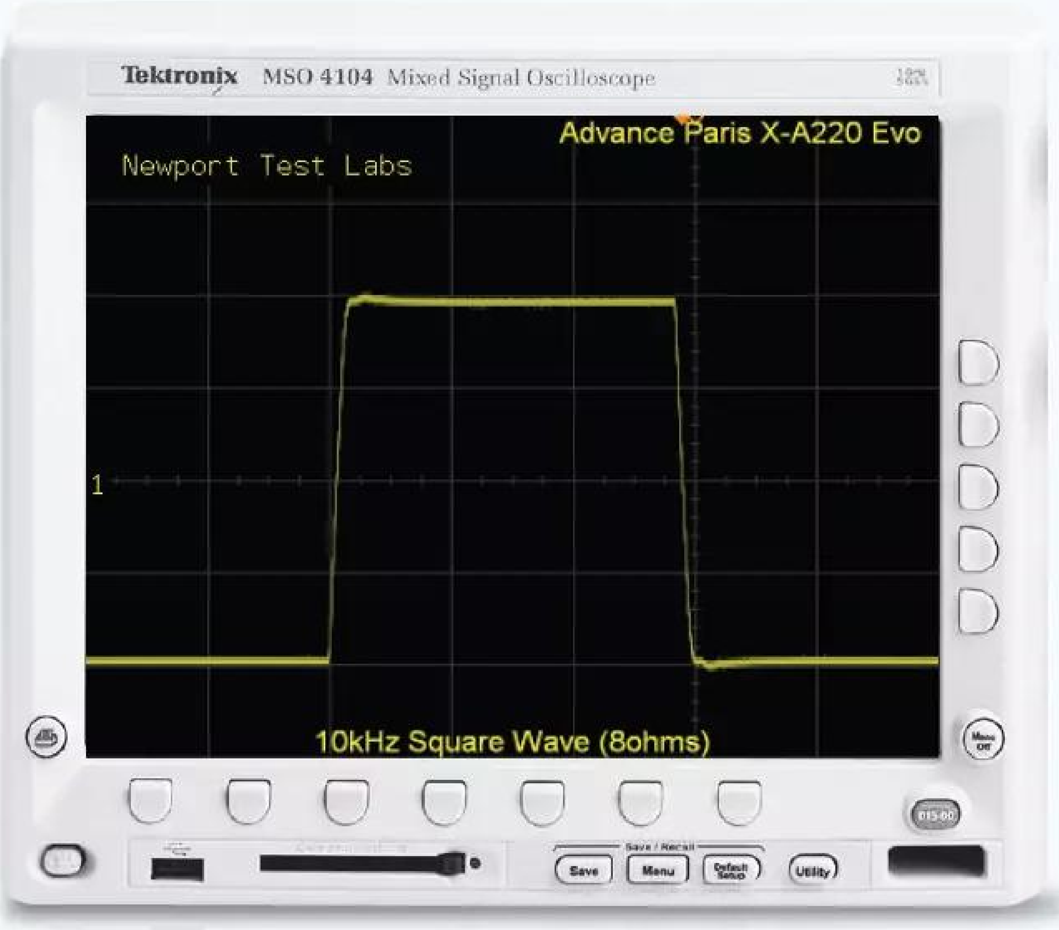
You are getting all the power you paid for (and more)… even at the frequency extremes… not always the case

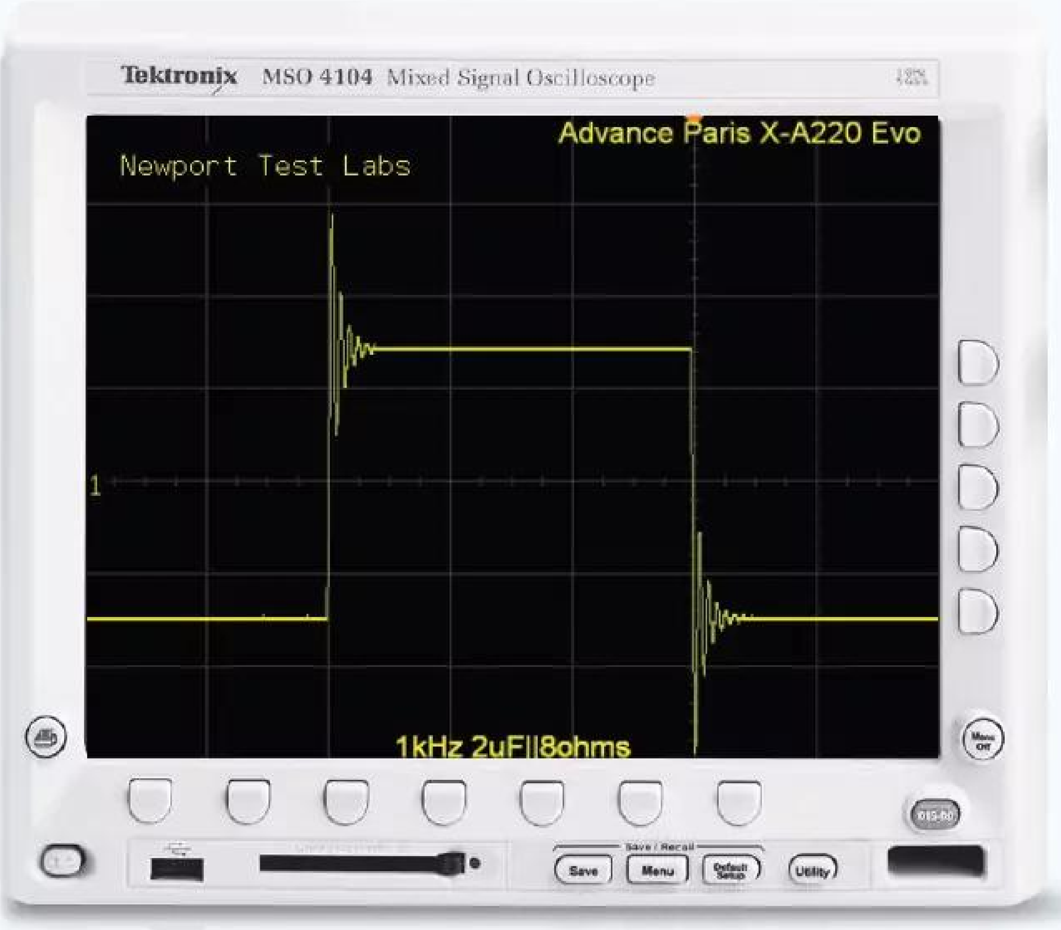
components when the power amplifier was driving both eight-ohm (Graph 3) and four-ohm (Graph 4) loads, but other than the first and second harmonic components, which were around 95dB down (0.00177%), every other component was over 100dB down (0.001%).

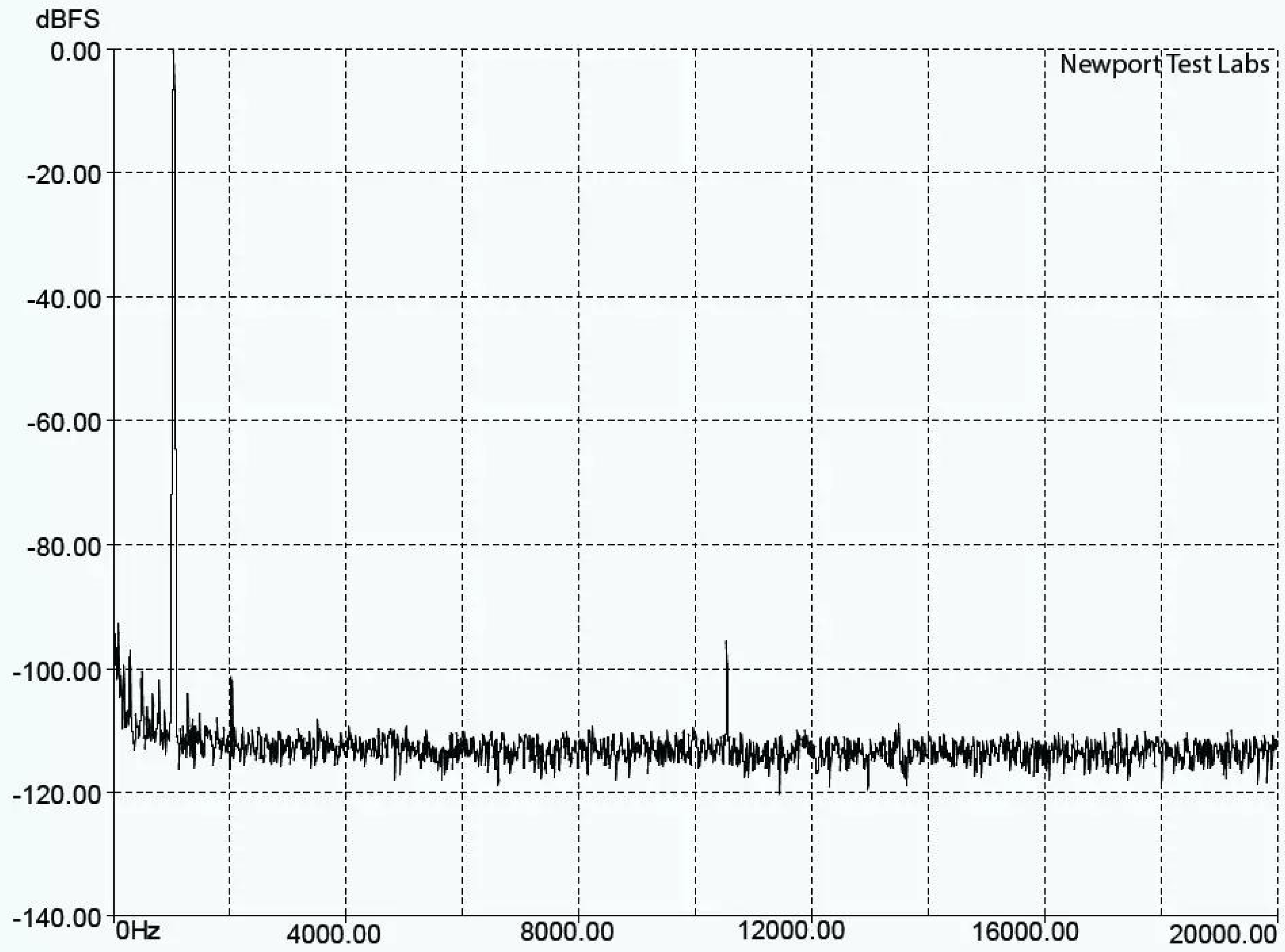
Intermodulation distortion is shown for an output of one watt (Graph 5) and 20 watts (Graph 6) into eight ohms. IMD at one watt is exceptionally low, with no regenerated difference signal (at 1kHz) and insignificantly low sidebands on either side of the 19kHz and 20kHz test signals. It increases when power output is upped to 20 watts, but the difference signal is



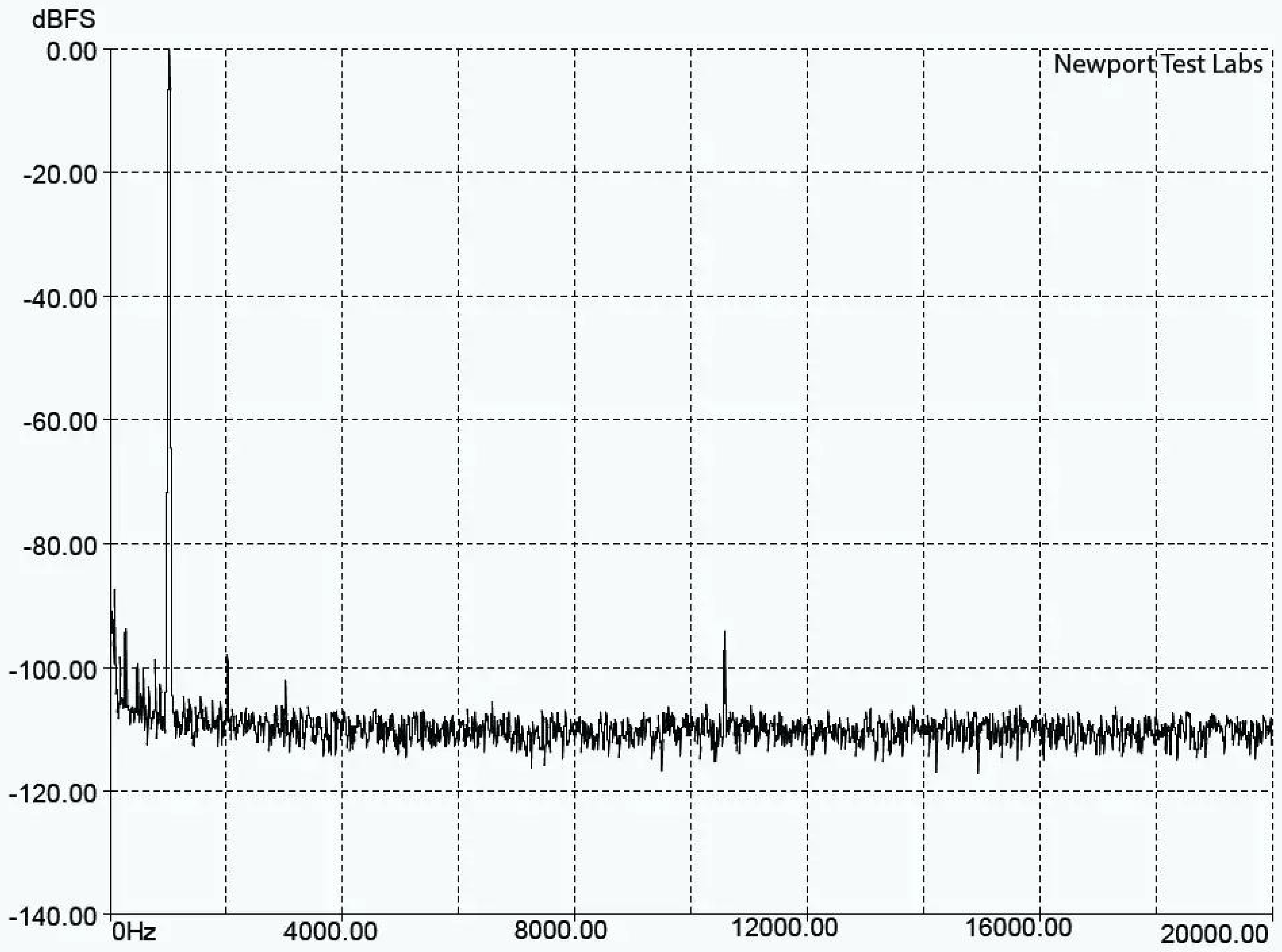




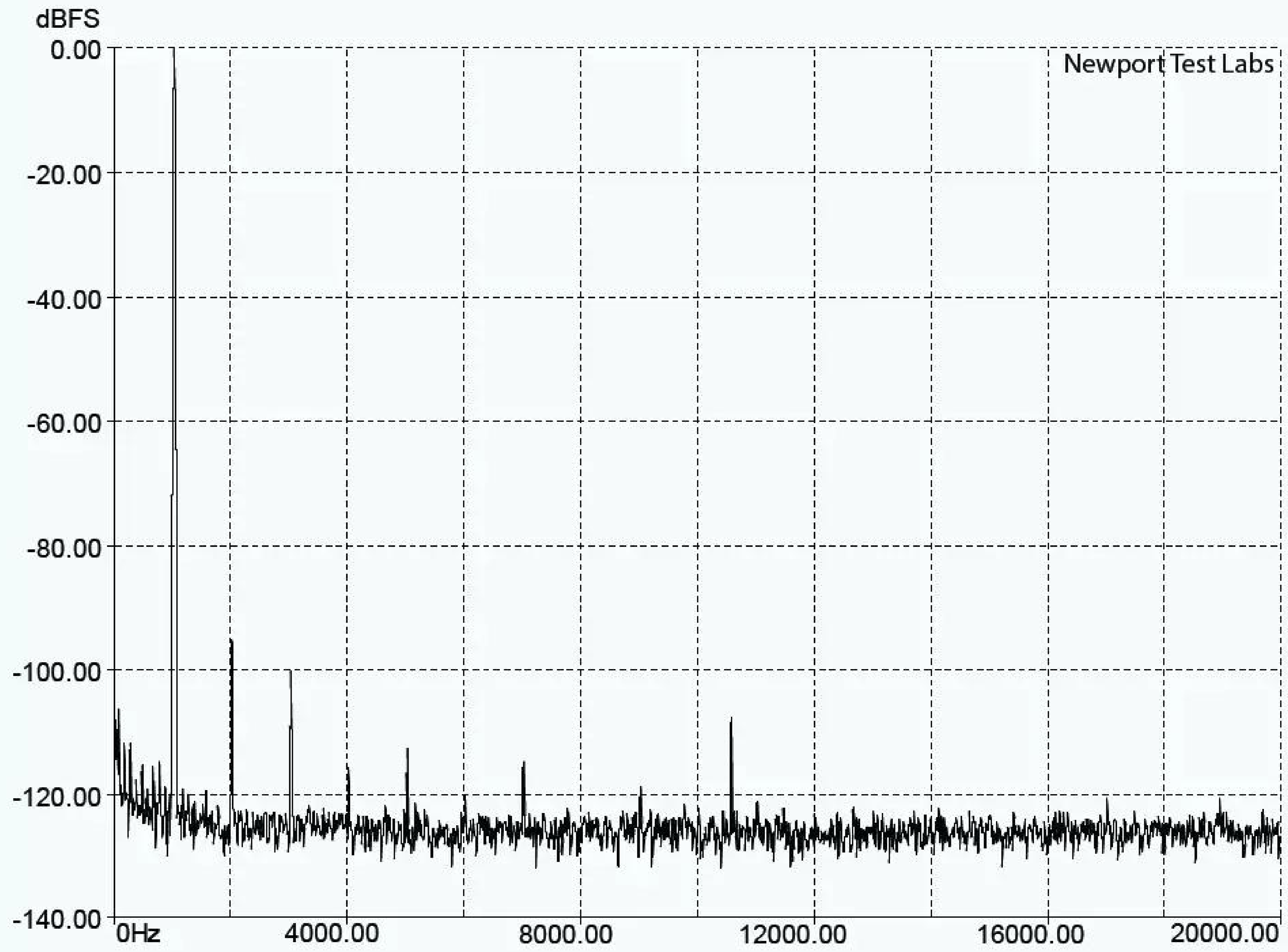




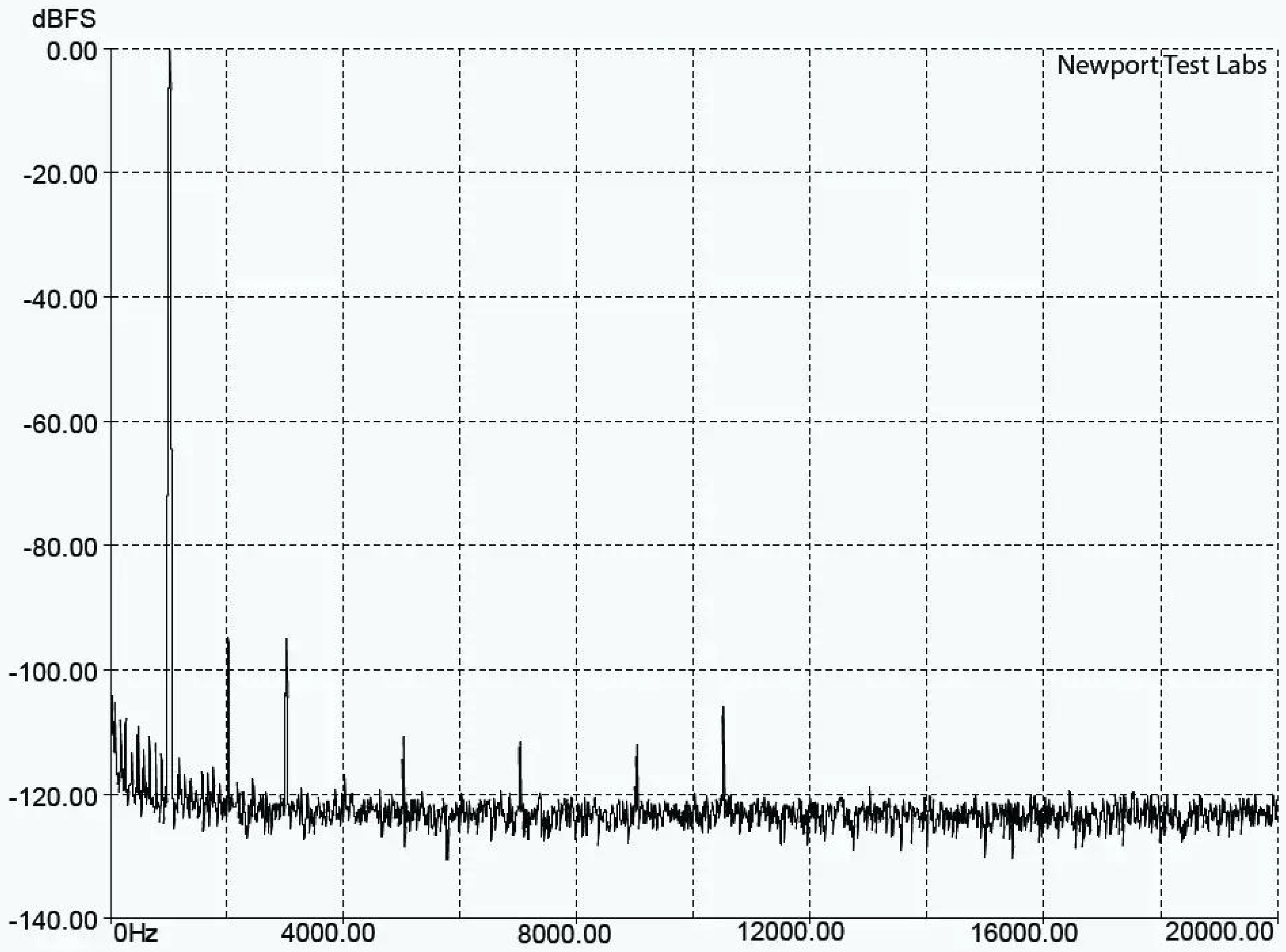
Graph 1. THD at 1kHz at one watt into 8-ohm non-inductive load.



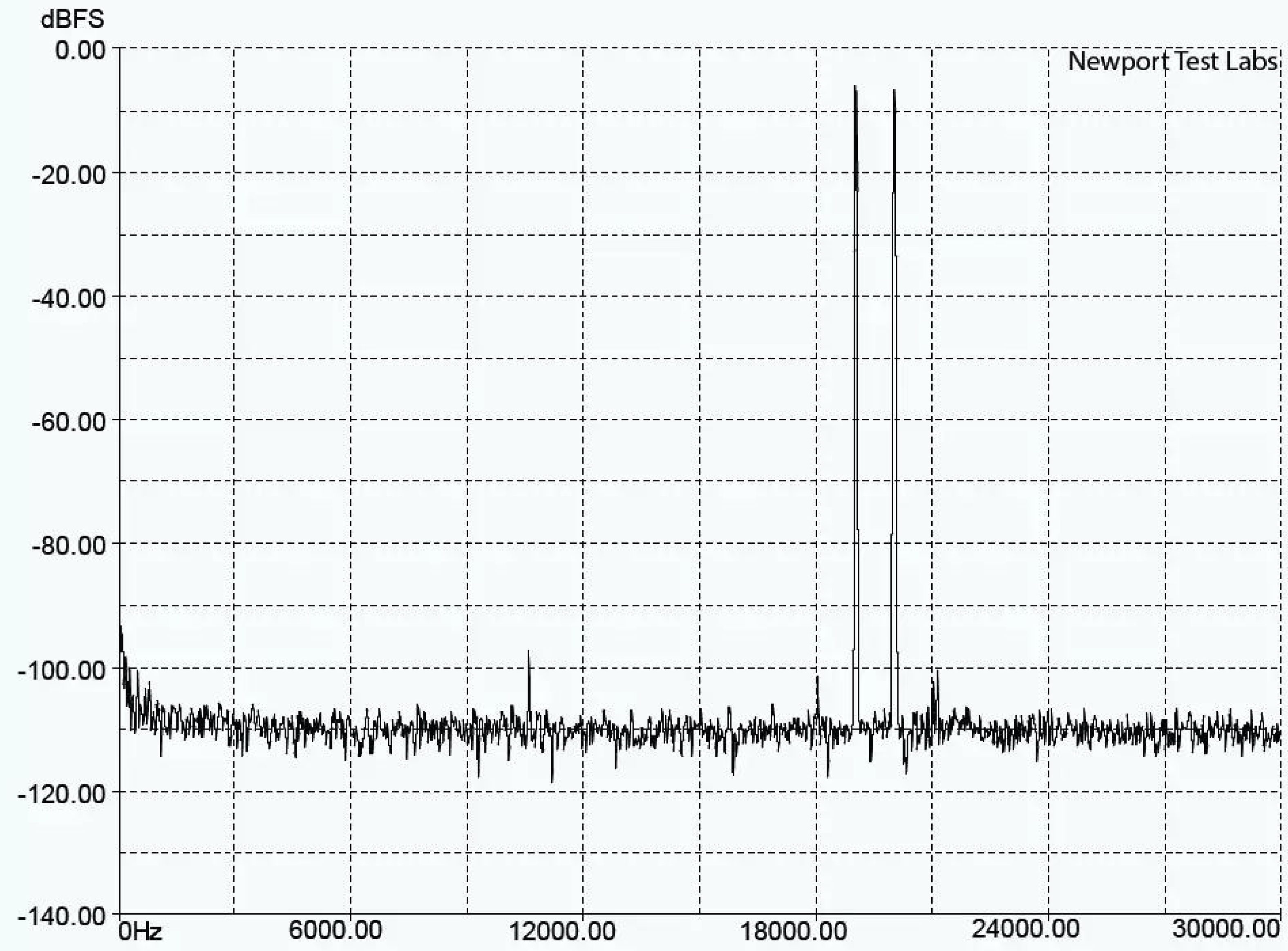
Graph 2. THD at 1kHz at one watt into 4-ohm non-inductive load.



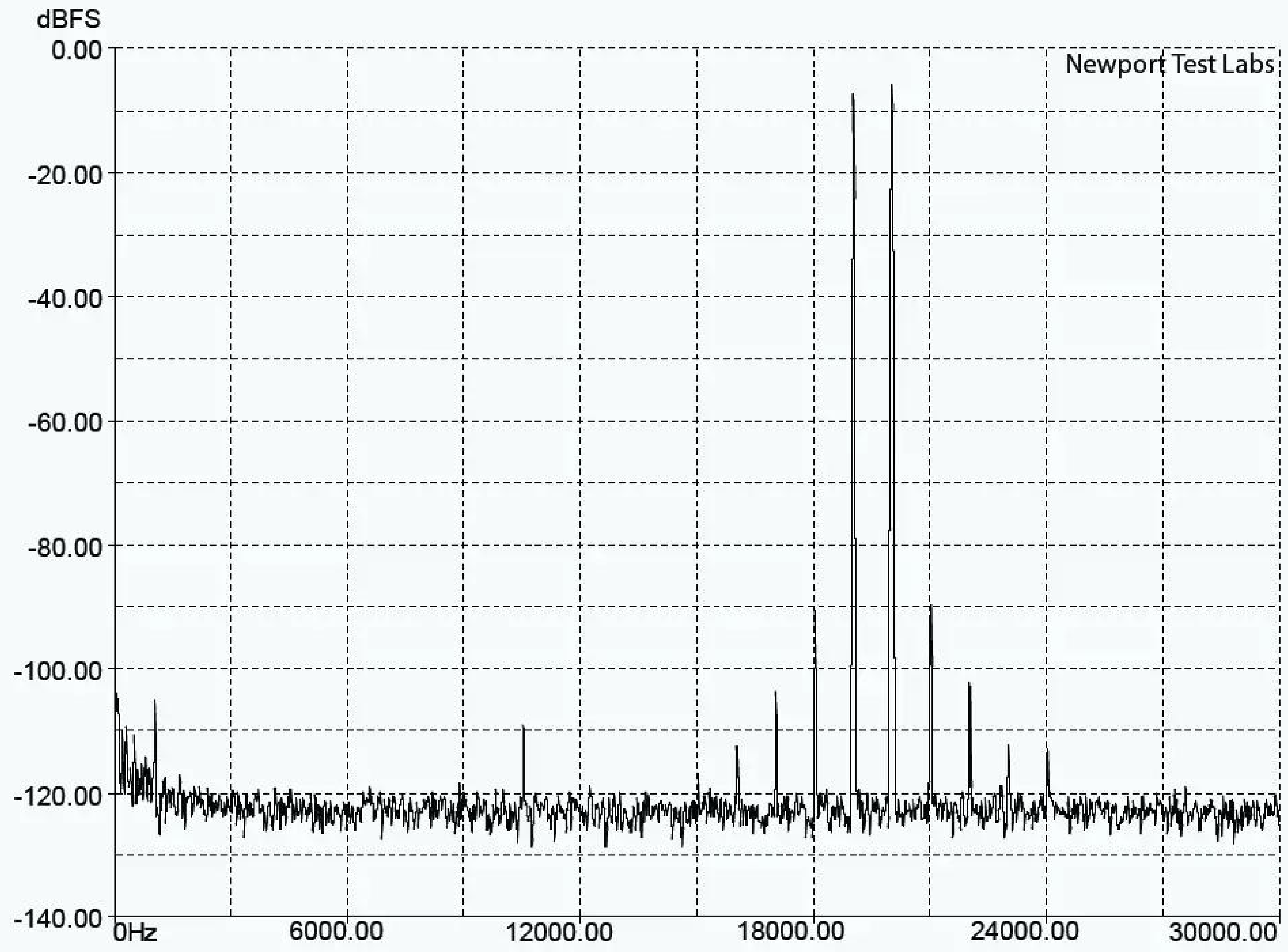
Graph 3. THD at 1kHz at 20 watts into an 8-ohm non-inductive load.



Graph 4. THD at 1kHz at 20 watts into a 4-ohm non-inductive load.



Graph 5. IMD (CCIF) at one watt into an 8-ohm non-inductive load.



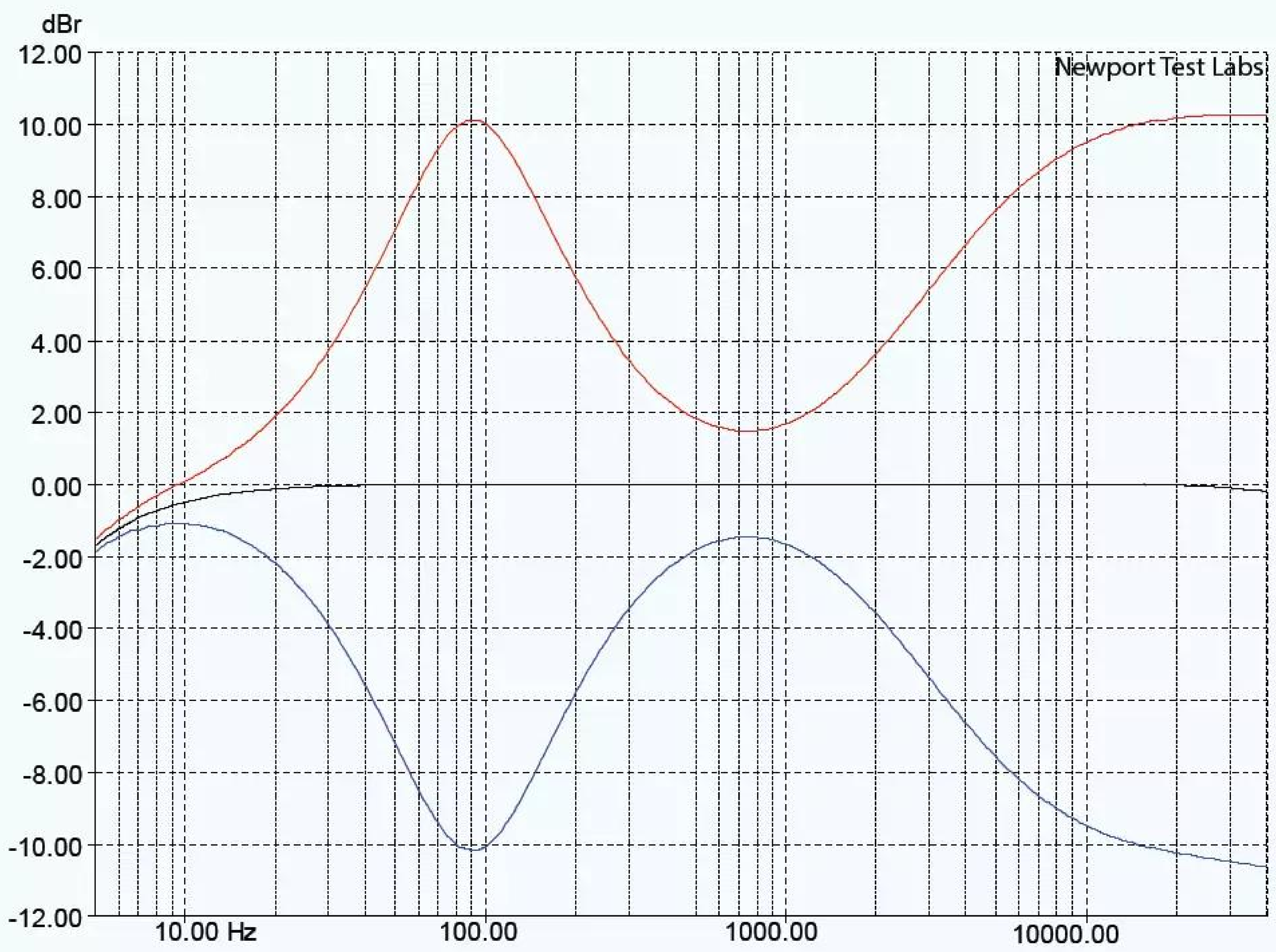
Graph 6. IMD (CCIF) at 20 watts into an 8-ohm non-inductive load.

down at –96dB (0.00158%) and the two highest sidebands are down at –90dB (0.003%). The other components are more than 100dB down (0.001%).

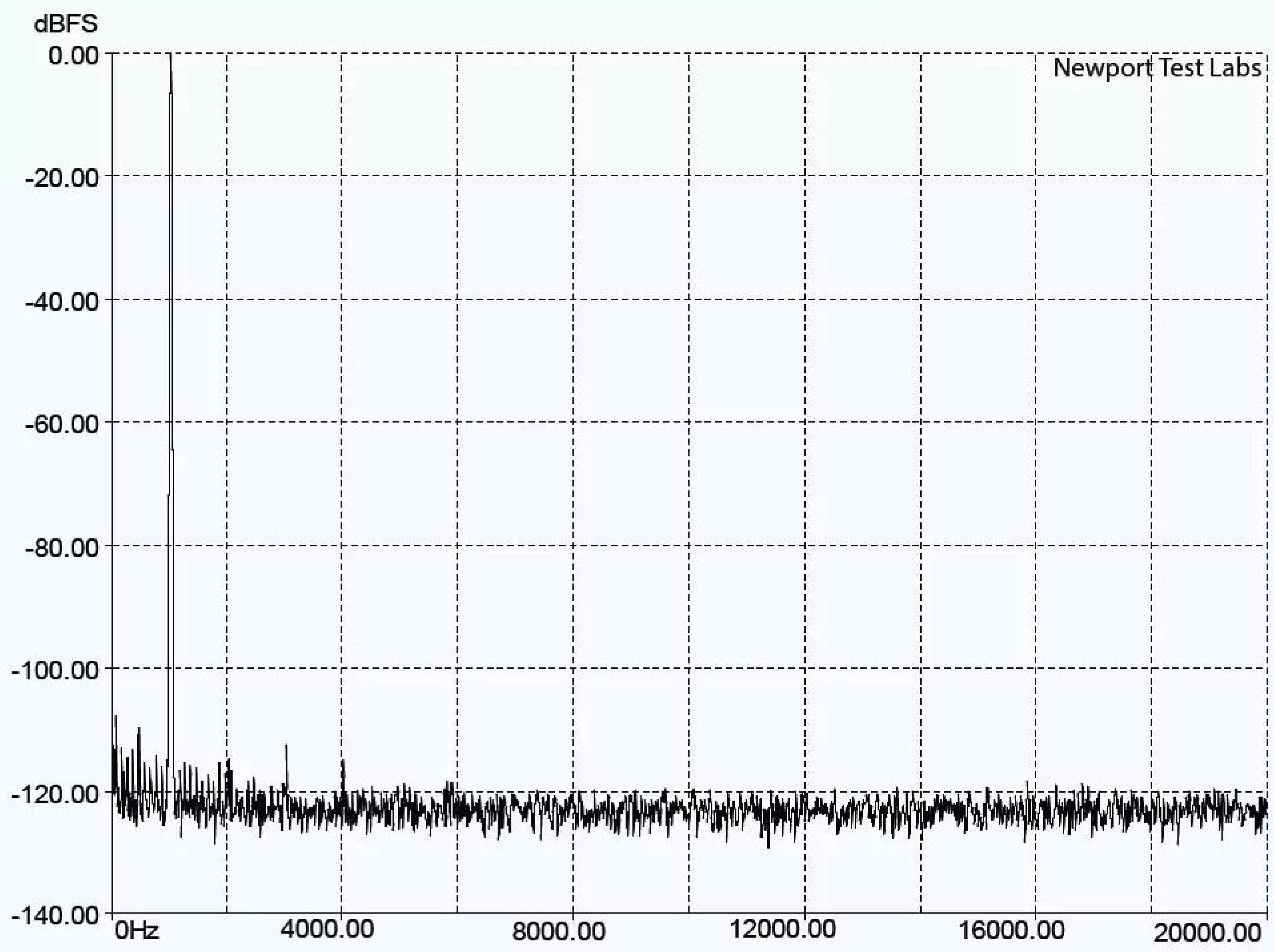
The frequency response of the Advance Paris pair is shown in Graph 7, along with the action of the tone controls. The overall frequency response of the trio extended from 9Hz to 100kHz ±0.5dB, and from 4.5Hz to 160kHz –3dB.

As you can see from this graph, Advance Paris has sensibly restricted the operating bandwidth of the bass control, so maximum boost is at 90Hz, with only 2dB of boost down at 20Hz. The contour of the treble control is more conventional, with boost shelved above 20kHz at about +12dB.

Channel separation was excellent, as you can see from the tabulated result table, with



Graph 7. Frequency response and tone contol action at one watt into an 8-ohm non-inductive load.



Graph 8. THD at 1kHz at one-watt output into 8-ohms. (Advance Paris X-A220 power amplifier only.)

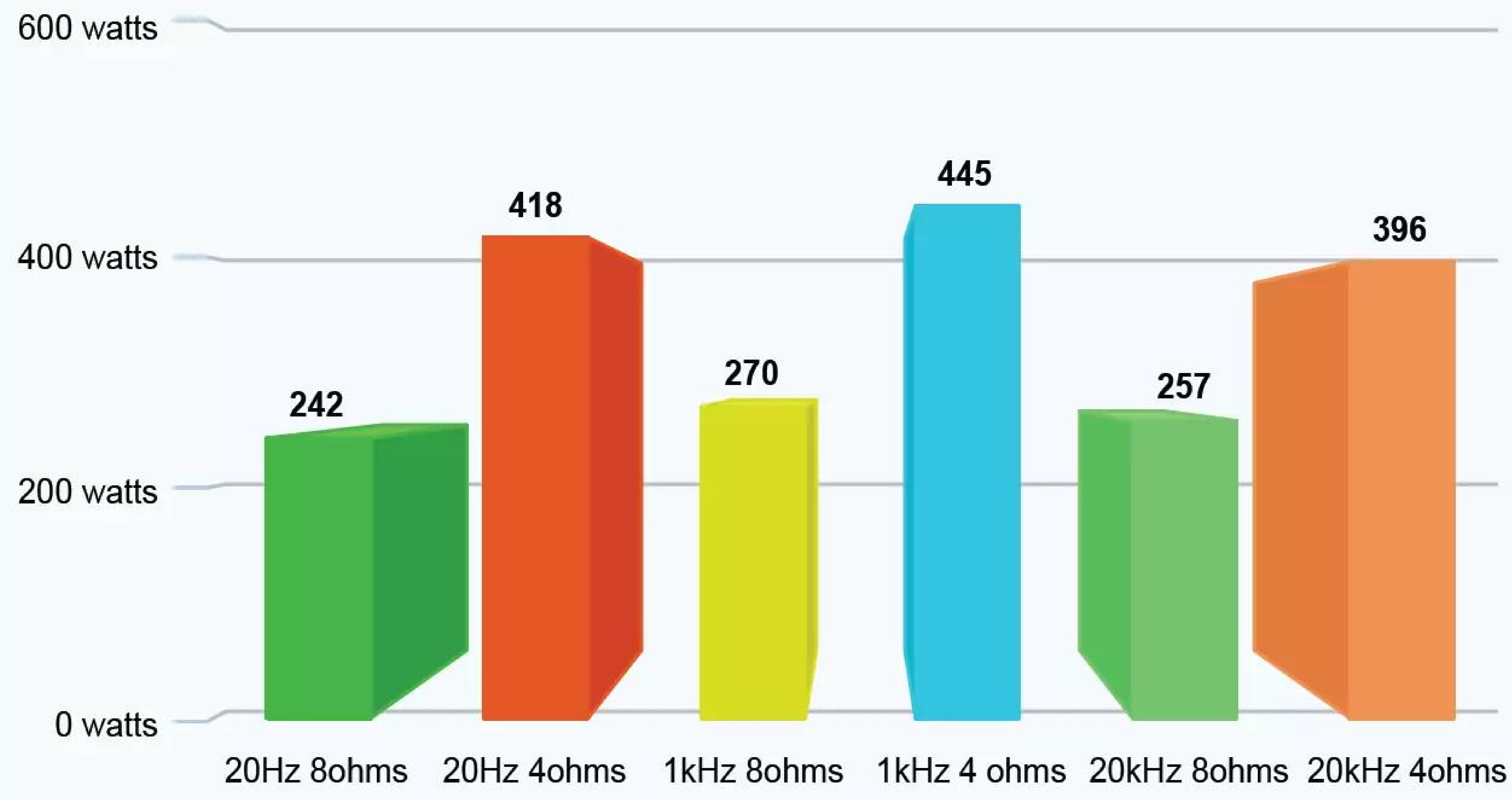
The 1kHz square wave is essentially perfect: you couldn't ask for a better result than is pictured here

the three amplifiers returning triple-digit results at low and mid-frequencies, and an absolutely excellent 97dB at 20kHz. Channel balance was also exceptionally good, with a difference in level between channels of only 0.062dB.

However, noise, referenced to a one-watt output, was a little higher than expected, with *Newport Test Labs* measuring an A-weighted signal-to-noise ratio of 74dB. This was likely due to the fact that the interconnects between the pre- and power amplifiers would have been exposed to considerable levels of electromagnetic interference due to the proximity of half-a-dozen test instruments and the fact that *Newport Test Labs* is located in an industrial area. There would be far less external electromagnetic interference in a home environment, which would no doubt result in improved figures. The signal-to-noise measurement of 92dB A-weighted when referenced to the rated output would seem to bear out this assumption.

The 100Hz square wave oscillogram shows the angle of tilt on the waveform that I'd expect to see, given the –3dB down-point of 4.5Hz. There's no bending, so low-frequency phase shift is under control, too. The 1kHz square wave is essentially perfect: you couldn't ask for a better result than is pictured here. The same can be said of the result from the 10kHz square wave test, which exhibits a very fast rise time and no unwanted artefacts, reflecting the extended nature of this trio's high-frequency response. Testing into a highly capacitive load showed a little more ringing than I might have otherwise expected, but that was very quickly damped, so the X-A220 Evo will be stable when driving any loudspeaker. It will also keep large bass drivers under control, thanks to an output impedance of 0.03 ohms, for a damping factor of 266.

Steve Holding



TECH SPECS

Advance Paris X-A220 Evo

Power Output (8Ω): 220 watts
Power Output (4Ω): 350 watts
Gain: 30dB (±1dB)
Frequency Response (–3dB): 10Hz–80kHz
Distortion: <0.08%
Signal to Noise Ratio: >100dB
Input Sensitivity: 1.4V
Input Impedance (Unbalanced): 32kΩ
Input Impedance (Balanced): 38kΩ
Power Consumption (Standby): 0.45 watts
Power Consumption (Max): 500 watts
Dimensions (hwd): 20 x 43 x 45cm
Weight: 21kg
Price: $2,900 (each)

Advance Paris X-P700

Output Voltage (Unbalanced): 2V
Output Voltage (Balanced): 4V
Max Output Voltage: 10.5V
Frequency Response: 20Hz–45kHz (±3dB)
Distortion: <0.007%
Signal to Noise Ratio: >103dB
Channel Separation: >80dB
Input Impedance (Unbalanced): 23kΩ
Input Impedance (Balanced): 35kΩ
Input Sensitivity (Balanced): 1.1V
Input Sensitivity: (CD/Aux): 300mV
Input Sensitivity: (MM): 2.5mV
Power Consumption: 30 watts
Dimensions (HWD): 15.5 x 44 x 43cm
Weight: 14.2kg
Price: $2,299

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Denon DP-3000NE

Turntable

- Removable headshell
- Quick start-up time
- High speed accuracy

- Annoying dustcover lid
- No pitch control

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Denon has been making direct-drive turntables for a very long time. Its very first, the DN-302F, specifically designed for use in Japanese radio stations, was released in 1970 — coincidentally (or not!) the same year Matsushita released the world's first direct-drive deck, the SP-10, having claimed to have invented the direct-drive motor system it used for it two years prior (see the 'Direct Drive' boxout overleaf).

Up until that year, all turntables were driven by either a belt or an idler-wheel. Radio stations didn't like the former design because they required continual maintenance and were slow to come up to playing speed, and they didn't like the latter design either as they not only required continual maintenance but also had higher levels of wow and flutter than belt-driven players.

The direct-drive design was the answer to the radio stations' prayers. The direct-drive motor required zero maintenance and had no belts or pulleys. The platter came up to playing speed almost the instant it was switched on (and stopped the instant it was switched off). And the drive had far lower levels of wow and flutter than any turntable using an idler-wheel.

THE EQUIPMENT

Unlike most turntables, whose power supplies are located separately from the turntable as either a 'wall-wart' or separate box, the Denon DP-3000NE has an onboard switch-mode power supply (SMPS). The reason for this comes down to the fact that power supplies that use transformers can vibrate at 50Hz, and this vibration can be transmitted to the phono cartridge, where it would be interpreted as a signal from the record and converted to an audible 50Hz tone. Turntables typically have outboard supplies to isolate those vibrations.

However, using an SMPS avoids the need for a transformer and its associated potential for hum. It also has a few other advantages, one of which is that it can compensate for voltage and frequency fluctuations in the 240V mains power supply which, with some turntable drive systems, might otherwise affect the rotational speed of the platter (though not in the case of the DP-3000NE, due to its DC operation).

The power supply provides the voltage (and current) for a 16-pole, 12-coil, brushless DC servo-motor that is an integral part of the die-cast aluminium platter, in that permanent magnets are fixed to the platter's underside while the stator is underneath it, fixed to the turntable. Speed control — an issue for all direct-drive turntables — is under the control of what Denon calls a 'space vector pulse width modulator' circuit (SV-PWM). This is, in the company's words, "a new design for the motor spinning control. SV-PWM is simply an algorithm used to control the PWM (pulse width modulation) module, which basically powers the motor. SV-PWM greatly reduces harmonics in the motor which can cause overheating and torque fluctuations and offers a continuous reliable voltage and frequency output for long periods of listening at any rotation speed or load via continuous feedback of the rotation speed".

Denon's SV-PWM circuit is intended to address a problem that affects all motors — particularly motors rotating at low speed: torque ripple. People often think of electric motors in terms of converting voltage into rotation, but what they really do is convert current into torque.

TECH SPECS

Type: Direct drive
Motor: 16-pole, 12-coil, brushless DC
Speed controller: SV-PWM
Speeds: 33.33, 45, 78rpm
Speed tolerance: ±0.3%
Deviation of rotation: ±0.5%
Wow & flutter (1): ≤0.06% (JIS)
Wow & flutter (2): ≤0.06% (WRMS
Starting torque: 4.5 kg/cm
S/N Ratio: >70dB
Power consumption: ≤4.1 watts
Power consumption (standby): ≤0.3 watts
Dimensions (HWD): 50 x 39.4 x 18.5cm

DL-103R Phono Cartridge
Price: $479
Type: Low-output moving-coil
Frequency range: 20Hz–45kHz
Output: 0.25mV
Impedance: 14 ohms
Stylus: 16.5 Micron round tip
Coils: Copper (6N)
Recommended tracking force: 2.3-2.7g
Compliance: 5 x 10-6cm/dyne
Weight: 8.5g

As no electric motor can be a perfectly stable load due to its impedance constantly being in a state of flux, no motor can ever draw a constant current, and so variations in current inevitably lead to variations in torque… hence the problem of torque ripple.

The problem with a low-speed direct-drive turntable motor is that, although its average speed is highly accurate, the continual 'corrections' necessary to control that speed mean that its exact speed at any given moment in time can wander either side of 33.33rpm quite significantly — even though the measured wow and flutter figures (because they are measurements averaged over a period of time) are low. The 'corrections' the motor makes mean that, because it is converting electrical current into torque (not rotation!), it constantly draws different currents, and each current variation results in a torque variation. The two primary sources of torque ripple are imperfections in (and differences between) the drive coils and the magnets, and an effect called 'cogging' which is where parts of the motor that are moving are magnetically attracted to parts that are stationary. (Belt-driven platters tend to rotate at exactly 33.33rpm more often and wander significantly less, thus typically having lower measured wow and flutter levels — though this natrually depends on the quality of the turntable!)

The DP-3000NE's plinth comprises a dark ebony natural wood veneer over a solid high-density wood cabinet that sits on four insulator feet designed to exclude external vibrations from reaching the phono cartridge. These feet are adjustable to allow for turntable levelling. At the left of the plinth is a very large, circular power switch button, and to the right a same-sized, similarly shaped platter speed control button with markings (and LED indicators) for 33.33rpm and 45rpm. Although the plinth looks to be flat, both in photos and real life, its edges are actually

DIRECT DRIVE

In a direct drive turntable, the platter is actually a part of the motor. Here, you can see that the ring of magnets is attached to the bottom of the DP-3000NE's platter. This ring slots into the circular 'trench' you can see on the turntable, where you can also spy several of the stators that drive the magnets.

Japanese multinational corporation Matsushita (the company behind the Technics and Panasonic brands) claims to have invented the world's first direct-drive turntable in 1968… but it didn't. Direct-drive turntable motors were invented in 1928. Sure, Panasonic was granted a Japanese patent in 1968, but it would be more accurate for it to say that it invented 'the world's first *electronically commutated* direct-drive turntable', and in fact this is exactly what the company claimed in order to be awarded a US patent in 1969 (US3683248A). That patent's abstract reads as follows: 'A turntable apparatus driven directly by an electronically commutated motor having a speed of 33 1/3 rpm or 45rpm which decreases the rumble and the wow and flutter to a minimum and assures these characteristics for a long time, the changing and adjusting of the turntable speed are carried out electronically without any mechanical mechanism, and the turntable is self-starting and can be built in a short time.' I put 'electronically commutated' in italics because this actually means that the motor is a brushless DC type, which is significant, as you shall discover…

As stated previously, many direct-drive turntable motors were available prior to 1970. Most used a system patented in 1928 by French company Paillard (which was later purchased by Thorens). The problem was that these direct-drive motors used alternating current (AC). This use of AC worked fine for the fast-rotating 78rpm records — the only ones that were available at the time — but when Columbia Records invented the long-playing 33.33rpm record in 1948, manufacturers quickly discovered that Paillard's AC motors could not be made to rotate correctly at this lower speed — nor could any other direct-drive motor that used alternating current. (And if you were wondering about 45rpm records, these weren't developed until a year after the LP… and no, they wouldn't work at this speed either.)

So it was the arrival of the 33.33rpm LP that forced turntable manufacturers to switch from using direct-drive motors to belt-drive and idler-drive designs so that they could continue to use AC drive motors.

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softly bevelled so that they curve slightly downwards — but it is difficult to see. Denon supplies a clear plastic protective dustcover lid that simply slides into two hinges at the rear of the plinth.

The S-shaped, statically balanced tonearm fitted to the DP-3000NE has an adjustable pivot post with 9mm of vertical height adjustment to enable a specific vertical tracking angle (VTA) to be achieved no matter what phono cartridge or headshell you use. It will also allow you to compensate for platter mat thickness, should you want to use a felt slip-mat instead of the rubber one Denon provides.

Two counterweights are provided for the arm. The main weight should be fitted when using phono cartridges that weigh between 4 and 16 grams. For heavier cartridges (up to 26 grams), the second counterweight must be screwed into the main counterweight. Anti-skating force is applied magnetically, so there is no physical contact between the anti-skate mechanism and the tonearm.

Note that although many of Denon's products are (and historically all of its turntables were) made in Japan, the DP-3000NE is made in China.

DENON DL-103R CARTRIDGE

The Denon DP-3000NE isn't fitted with a cartridge, enabling you to save money by using one you already own or leaving you free to choose your own based on your own listening sessions and/or previous personal experience.

If you would like a recommendation for a cartridge to investigate, I suggest Denon's DL-103R low-output moving-coil cartridge, which *is* made in Japan! I asked for it to be included with my review sample because it's one of my all-time favourite cartridges and has been in production in one implementation or another for more than half a century. I also own the earlier (non-R) version and was interested in comparing it with the newer one. Despite being electrically upgraded (it uses 'six nines' copper in its coil windings, for one), the 'R' version has the same conical diamond stylus as the older model, rather than one of the newer elliptical profiles (though you could always upgrade this). Of course, if you would prefer the generally lower cost and greater convenience of a moving-magnet cartridge with an easily replaceable stylus, I would recommend using a model from either Audio-Technica or Ortofon.

As the DL-103R is a low-output design, you will need a moving-coil step-up device (transformer or phono preamplifier), but the nominal output (0.25mV) is high enough that you would have a wide choice of suitable candidates.

IN USE

Assembling the Denon DP-3000NE is very straightforward as it is simply a matter of installing the platter and platter mat, fitting the dustcover and connecting the power and signal wiring. When the time comes to install your cartridge in the headshell, Denon has simplified the process enormously by providing an overhang gauge to ensure the stylus is correctly aligned. I checked the accuracy of this gauge using a specialist cartridge alignment tool (Pro-Ject's Align-It Pro) and found it was spot on.

The DP-3000NE's clear plastic protective lid was a little annoying, though, because it only stayed up when in the almost-vertical position. If moved from this position, it dropped quite quickly to clunk down on the plinth, so you would want to be careful closing it when a record is playing so that the stylus doesn't skip. However, my review sample was a showroom demonstrator and therefore had had a hard life before it was sent to me, so maybe there is indeed a way to soften the fall of the lid. If there is, I couldn't find it in the manual. Speaking of which… I must confess that although I had been told that the DP-3000NE was able to play 78rpm records, I thought I had been misinformed, because while the single-speed button switched back and forth perfectly between 45 and 33.33rpm, I couldn't get it to switch the platter speed to 78rpm no matter how I pressed. The manual informed me that to play at the higher speed, I needed to in fact hold down the 33/45rpm button and simultaneously press the Start/Stop one. With this action, both the 33rpm- and 45rpm-speed indicators glow simultaneously and the platter speed increases to 78rpm. Phew!

The start-up time is almost instantaneous at either 33.33 or 45rpm (I didn't check 78rpm because I don't own any 78s!). Speed accuracy was also exact, with a recorded 'middle C' note exactly matching the pitch of middle C on my recently tuned piano. However, this speed test reminded me that, unlike most direct-drive turntables, the DP-3000NE doesn't allow you to adjust platter speed so that you can use a fixed-pitch musical instrument (such as a piano!) to play along with records for enjoyment or educational purposes. Admittedly, this omission will affect only a handful of potential buyers — but still…

I span up my usual old 'war-horse' LPs to check for wow and flutter levels (Satie's 'Gymnopédie No. 1', Liszt's 'Légende No 1 St

If you would like a recommendation for a cartridge to investigate, I suggest Denon's DL-103R…

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François d'Assise' *et al*) and drew blanks — no audible flutter and no audible wow — so Denon's SV-PWM circuitry is doing its job properly. I also listened for rumble and again drew a blank — there was no audible low-frequency turntable noise, so bearing noise is suitably low.

As for the DL-103R cartridge, I found it performed slightly better than my older version: there was slightly greater weight in the low frequencies, slightly lower distortion across the all-important midrange and very slightly improved channel separation and stereo imaging, but the overall level of detailing seemed much the same. The overall character of the sound seemed unchanged too — which is good!

CONCLUSION

I suspect that a good many audiophiles purchase belt-drive turntables precisely because they are so fiddly and time-consuming to operate and maintain — which makes a lot of sense if hi-fi is your hobby. But if you are into hi-fi because you want to hear great sound quality and own a turntable that is built like a battleship (and may last longer than one) and won't need any maintenance along the way, direct-drive is the way to go, and Denon's new DP-3000NE is a fine example of the breed. ***Greg Borrowman***

CONTACT
Brand: Denon
Model: DP-3000NE
RRP: $4,499
Warranty: Three years
Distributor: Masimo Consumer Australia
Address: 86 Peter's Avenue Mulgrave, VIC 3170
T: (03) 8542 1111
W: www.denon.com/en-au

Laboratory Test Report

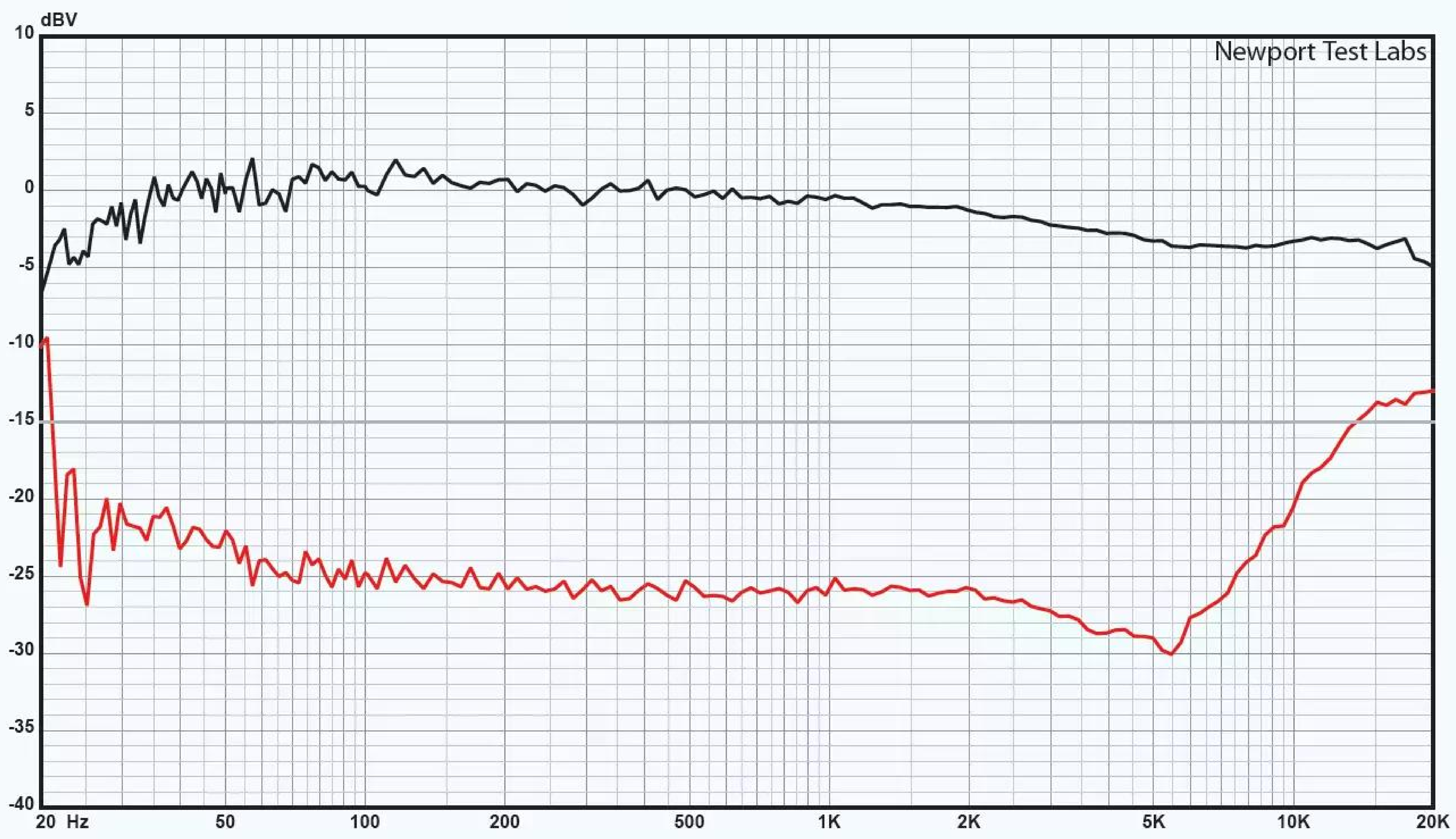
Readers interested in a full technical appraisal of the performance of the Denon DP-3000NE turntable and DL-103R moving-coil cartridge should continue on and read the LABORATORY TEST REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

The frequency response and channel separation of the Denon DL-103R cartridge, as measured by *Newport Test Labs* when installed in the DP-3000NE, is shown in Graph 1. It is important to note that, while such measurements for most phono cartridges are made using measurements either taken at individual frequencies, joined together in a 'splice the dots' fashion, or by using a frequency sweep technique that means the cartridge only reproduces a single frequency at a time, *Newport Test Labs* uses a pink noise test signal and requires the cartridge to simultaneously reproduce all frequencies between 20Hz and 20kHz. This is naturally a much more difficult task for a phono cartridge, but one that is closer to what you'd hear when it is reproducing music.

You can see from the graph that the response extends from 20Hz to 20kHz ±3.5dB. This is an excellent result, not least because the graph has not been 'smoothed' via post processing, which would have, for example, removed the peaks at 56Hz, 80Hz and 120Hz and delivered a response that was within ±3.0dB. Either way, the measured result is outstandingly good.

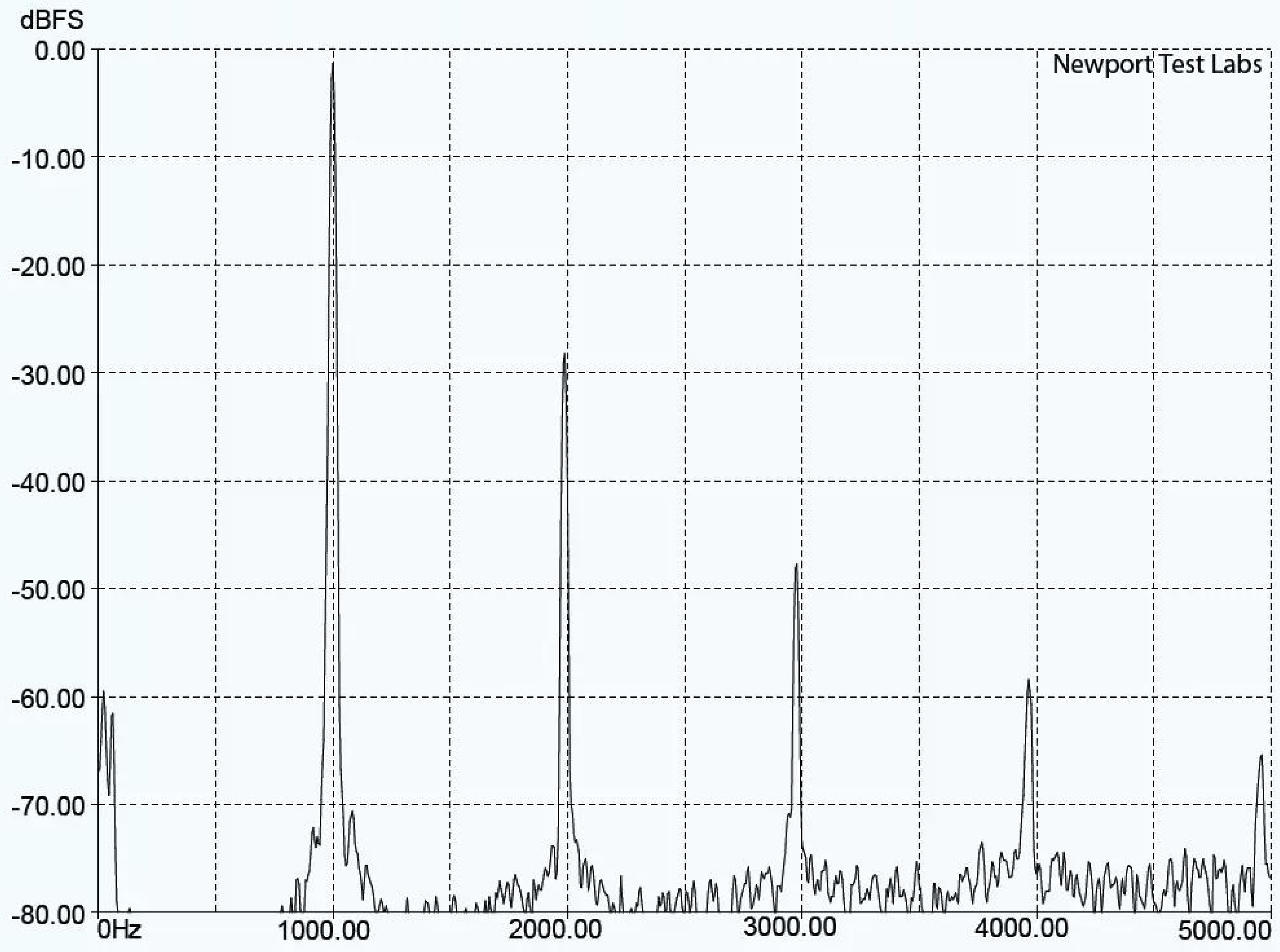
Channel separation (the red trace on the graph) was also excellent, as you can see for yourself, averaging around 25dB almost right across the frequency band, with standout results of 27dB at various frequencies. Separation diminishes quickly above 6kHz, but this is typical of all phono cartridges. Also notable is that low-frequency channel separation, despite dropping below 25dB, is still far better than I often see.

Harmonic distortion levels for the DL-103R were fairly typical, with the good-sounding second harmonic dominating at just 28dB down from reference, equivalent to 3.98% distortion. The inevitable third harmonic was far lower in level, at around 48dB down (0.398%). As you can see, there was also a fourth harmonic at –58dB (0.125%) and a fifth at –65dB (0.056%). What is significant here, which has nothing to do with the cartridge *per se*, is that the background noise of both the test record and DP-3000NE turntable is low enough to allow these harmonics to be easily visible on the graph. Indeed, you can see the

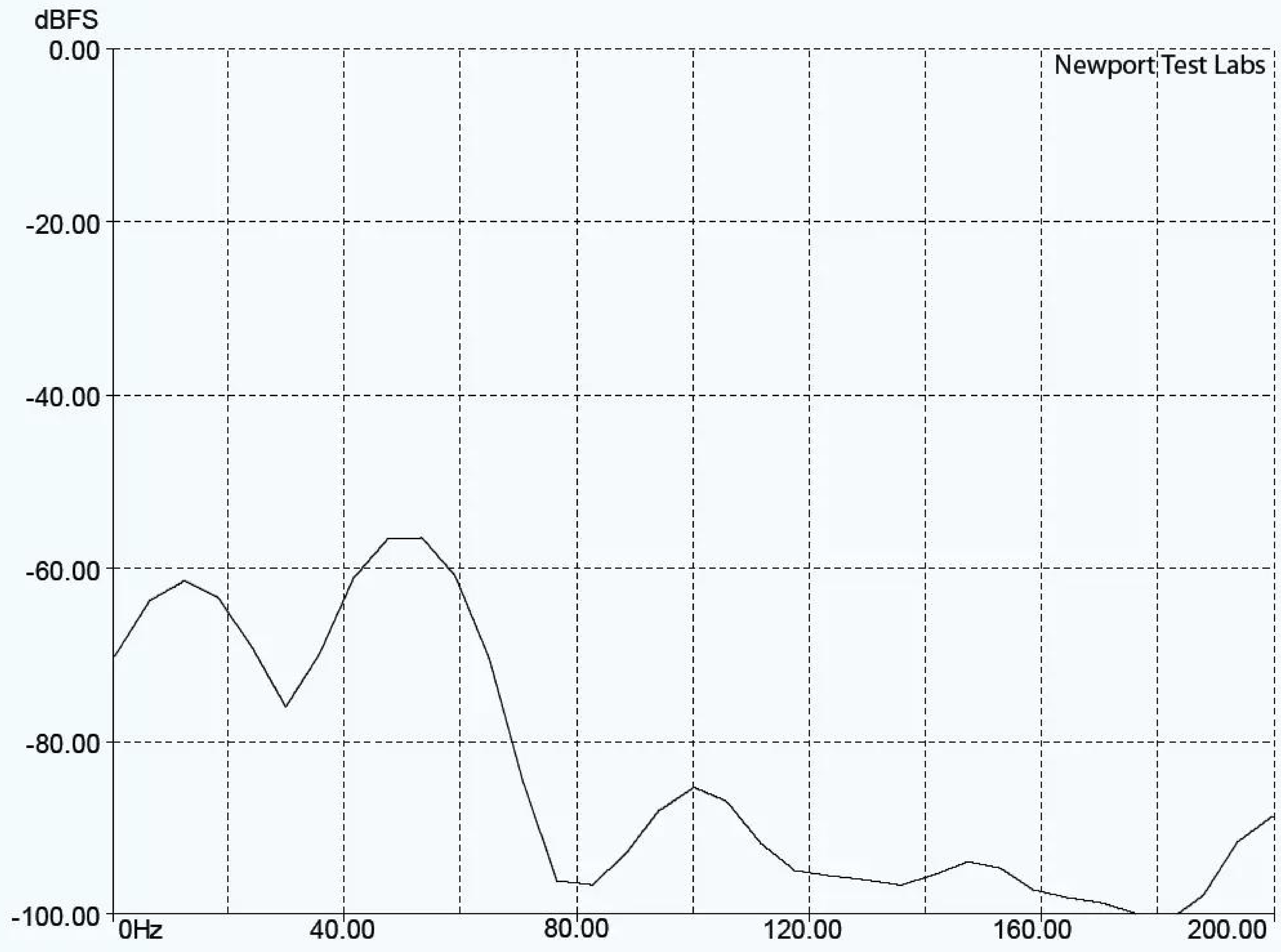


Graph 1. Frequency response (black trace) and channel separation (red trace) of Denon DL-103R phono cartridge

Graph 2. Denon DL-103R cartridge. THD at 1kHz at recorded velocity of 0.4cm/second.



Graph 3. Denon DL-3000NE turntable. Rumble referenced to 1kHz at 5cm/second.



Low-frequency channel separation, despite dropping below 25dB, is still far better than I often see

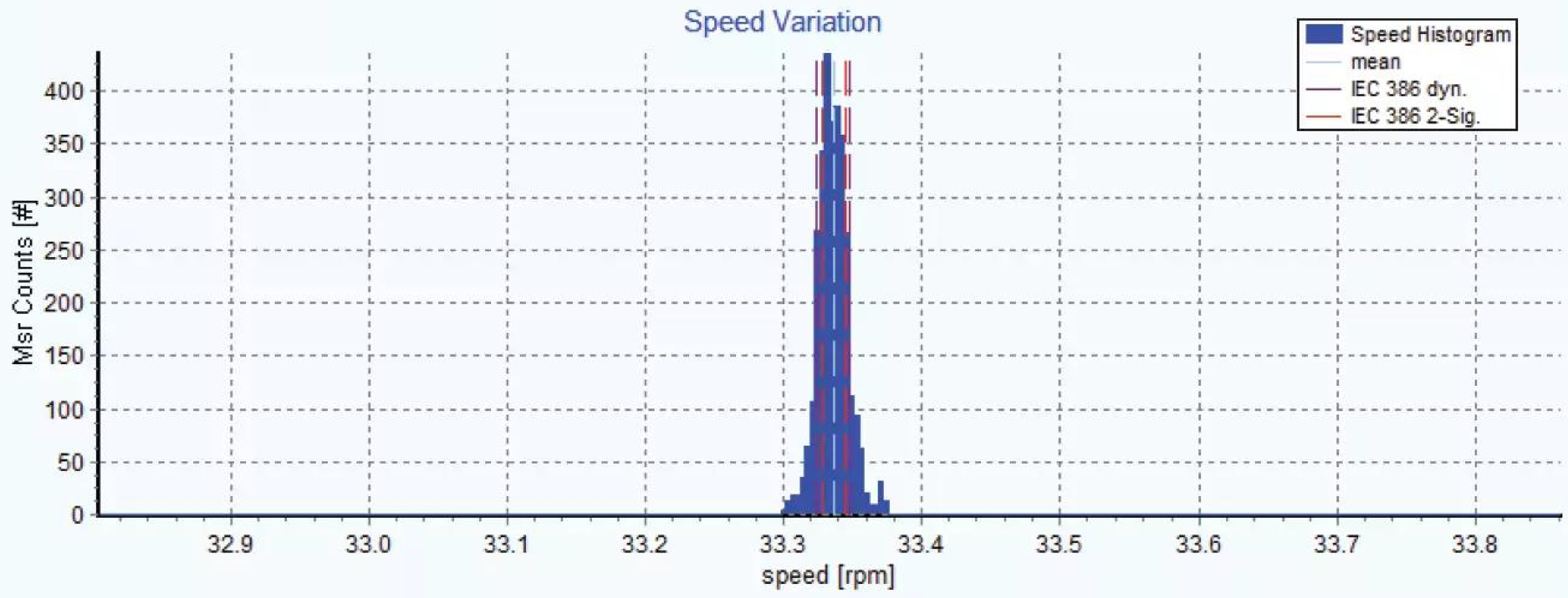
noise floor is down at around –80dB.

The low-frequency noise 'rumble' of the Denon turntable is shown in Graph 3, referenced to a 1kHz test signal recorded at 5cm/second. However, to eliminate the inevitable contribution from a test record, the noise floor was captured using a Rumpelmesskoppfler, a device invented and manufactured some years ago by Thorens. You should ignore the peak at 50Hz, as this is merely background signal induced into the measurement setup by mains wiring, meaning that noise is more than 63dB down at very low frequencies (below 70Hz); more than 80dB down above 70Hz; and better than 90dB down until above 120Hz. These are excellent results and exceed Denon's specification for this aspect of performance, which it labels as 'signal-to-noise ratio' and puts as 70dB.

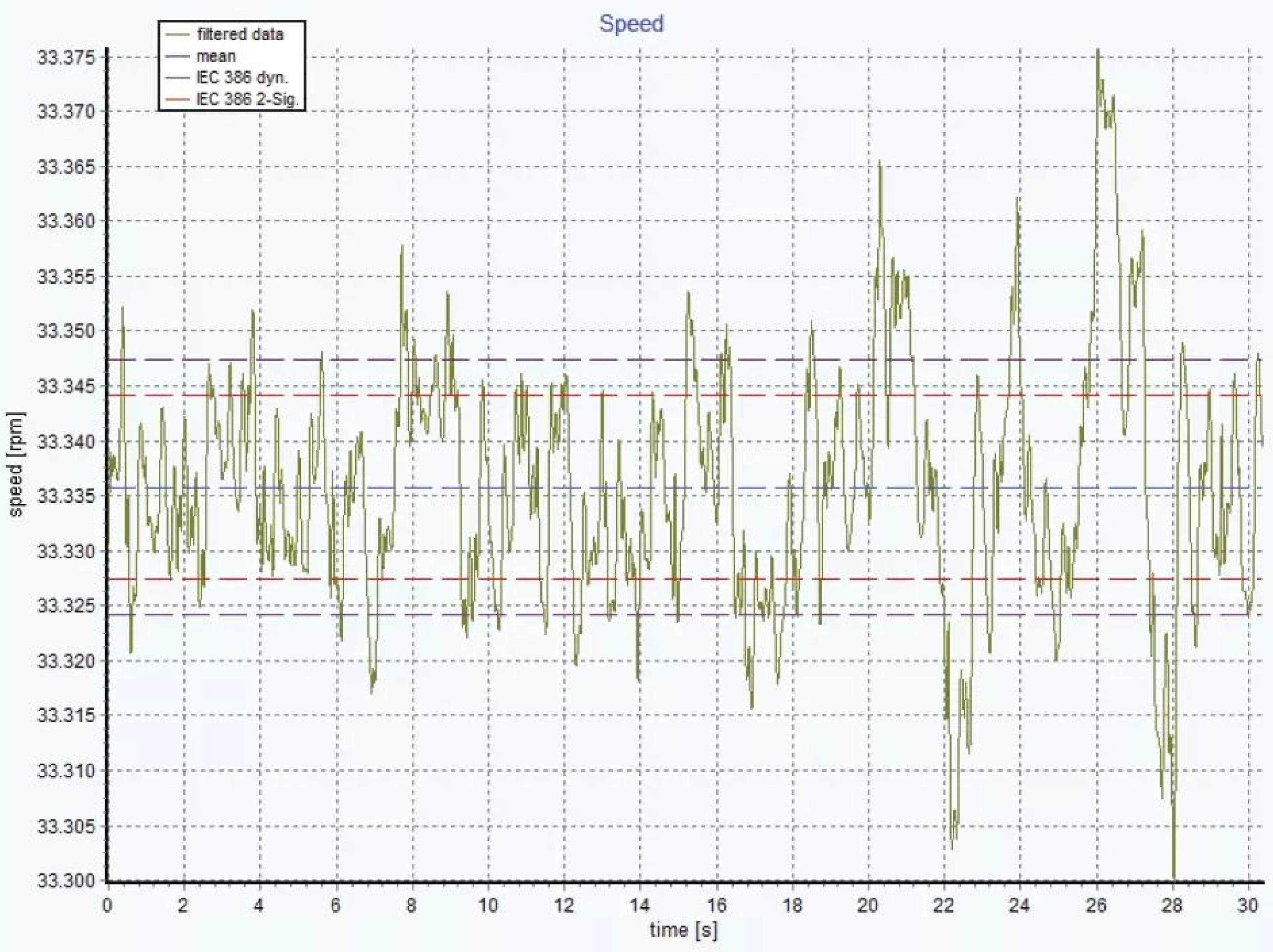
The absolute speed accuracy of the DP-3000NE was superb, as you can see from Graph 4 (a histogram showing speed accuracy). You can see that the mean is at exactly 33.33rpm. The variations in speed are minuscule and most are almost certainly artefacts of the test record itself (which, incidentally, was made by Denon!)

Newport Test Labs first measured wow and flutter using the DIN IEC 386 measurement standard, the result of which is shown in Graph 5. Averaged over the 30-second graphs, the result was 0.07% unweighted and 0.05% weighted. The unweighted 'wow' component was measured at 0.09% and the unweighted 'flutter' component was measured at 0.03%. When measured to the CCIR standard, the results were identical to those obtained using the DIN standard. *Newport Test Labs* also measured to the Australian standard for two platter speeds; the results were 0.04% RMS unweighted at 33.33rpm and 0.035% RMS unweighted at 45rpm. The former figure is superior to Denon's similar specification of 0.06% RMS weighted, so essentially the review sample outperformed the player Denon used to produce its specs!

Overall, both the Denon DL-103R phono cartridge and DP-3000NE turntable performed outstandingly. ***Steve Holding***



Graph 4. Histogram showing the absolute speed accuracy of Denon DP-3000NE turntable.



Graph 5. Denon DP-3000NE turntable wow and flutter (using DIN IEC 386 standards).

March Audio Ukkonen AWG

Loudspeakers

- Unbelievable bass!
- Awesome mids and highs
- Your choice of colour finish

- 'Audionability'
- Efficiency slightly below average

RRP **$10,000**

I have to admit, I wondered why March Audio's latest floorstanding design was called 'Ukkonen' because the word is Finnish yet the designer, Alan March, was born in the UK, the bass drivers are made in Denmark, the tweeters are made in East Java (quite close to Bali, in fact!) and the speakers themselves are designed and assembled entirely in Australia... Western Australia, to be precise.

According to March (who now calls Australia home, the reason for which can be found in the break-out box included with this review), 'Ukkonen' is the most appropriate word to describe "the incredible bass extension and dynamics" of his new loudspeaker because it translates in English to 'thunder'.

THE EQUIPMENT

As you have probably guessed from looking at the images accompanying this review, the Ukkonen AWG is a two-way, bass-reflex floorstander. It marries a 221mm mid/bass driver to a 29mm horn-loaded tweeter, and the bass reflex port front-fires via a thin slot at the base of the front baffle.

The Denmark-made bass driver is designed and manufactured by Purifi (PTT8.0X04-NAB-01) and has several unique features. For one, its half-roll surround is so different that it's not really a 'half-roll' at all, but instead uses an irregular geometry that Purifi calls a 'Neutral Surround'.

According to Purifi, cone drivers that use conventional half-roll surrounds (which is most of them!) are fundamentally flawed because during half of the cycle of an audio signal (when the cone is moving inwards), the effective radiating area (Sd) of the cone plus surround increases and, conversely, during the other half of the same audio signal (when the cone is moving outwards), the radiating area decreases, so conceptually you're using one cone to produce half the waveform, and a totally different one for the other half. The result, as you'd expect, is increased distortion compared to if the effective radiating area remained the same throughout the full cycle of the audio waveform.

Purifi's director, Claus Neesgaard, says that the special geometry of its 'Neutral Surround' combats what he calls 'surround radiation distortion' (or 'SRD'): "This position-dependent effective radiating area — we refer to it as Sd(x) modulation — is a direct contributor to distortion and IMD (intermodulation distortion) and thus is a must-fix problem if the goal is excellent sound quality. Our proprietary surround geometry keeps Sd(x) modulation at a minimum, and practically eliminates SRD. We further optimise the geometry to deliver a number of other benefits by controlling the critical cone/surround edge break-up to improve the frequency response and to provide resilience against back-pressure, this last being especially useful when the driver is used in a cabinet with a constrained internal volume."

The cone suspended by this surround is made from black anodised aluminium and driven by a 52mm diameter voice coil that is 23.6mm long and wound using two layers of copper-coated aluminium wire and a proprietary coil-winding technique that reduces coil inductance compared to the usual industry-standard winding technique.

> **Your Ukkonen floorstanders can be painted in any colour you like from the RAL colour gamut**

The 29mm Satori beryllium dome tweeter is manufactured in East Java, Malaysia by SB Acoustics

UNUSUAL MOTOR SYSTEM

In any moving-coil loudspeaker, the moving (voice) coil produces a varying magnetic field that interacts with the fixed magnetic field generated by the magnet to move the voice coil and thus the cone to which it is attached. However, the interaction is not constant because as the voice coil moves through the fixed field, its inductance changes, meaning the coil's inductance is different for every position between the two extremes of excursion (from fully 'in' to fully 'out'). The result is that the force factor changes if a change in stored magnetic energy happens when the voice coil moves position.

This storage of energy causes an asymmetry between the force factor and the ratio between velocity and the back-EMF produced by the motor. Purifi calls these changes 'Force-Factor Modulation' (or 'FFM') and says that although loudspeaker designers have been aware of this problem for some time, the industry-standard model they have been using to predict this dynamic force — and thus design their drivers — has resulted in non-optimal motors. (The Purifi team delivered a paper on this very subject, titled 'Force Factor Modulation in Electro Dynamic Loudspeakers', at the 141st Audio Engineering Society International Convention in 2016).

In the Purifi PTT8.0X04-NAB-01 driver used in the Ukkonen AWG, Purifi has minimised FFM firstly by reducing the permeability of the pole, resulting in a reduction in inductance primarily because FFM is determined by the absolute change in inductance versus position, not the relative change. At the same time, the company also replaces most of the pole with a permanent magnet, to the top of which it attaches a section

of unsaturated material. This approach to pole design makes the driver more difficult (and thus more expensive) to manufacture, but it effectively eliminates FFM.

> I have never (ever!) heard so much high-quality deep bass from any equivalently sized driver

SATORI TWEETER

The tweeter in the Ukkonen AWG is a Satori TW29BNWG, which has a 29mm-diameter beryllium dome driven by a neodymium motor system. The Satori tweeter (which is manufactured in East Java, Malaysia by SB Acoustics) is fronted by a very large horn — or, as March Audio prefers to call it, an 'integrated waveguide'. Of its purpose, March says: "The waveguide controls the directivity of the tweeter, allowing it to perfectly match that of the mid/woofer at the crossover point. The controlled directivity also ensures the indirect sound from reflections within your room accurately match the timbre of the direct sound from the tweeter. This provides a much more cohesive sound that is more consistent in different rooms."

The Ukkonen's bass reflex port (it would more accurately be called a 'slot' than a 'port') is, as you can see most clearly from the photo on page 56, located very close to the base of the cabinet on the front baffle. You needn't worry if you have thick pile carpet that might otherwise have obscured this slot, though, as the loudspeakers come with outrigger feet that not only elevate the slot but also improve the stability of the tall, narrow Ukkonen cabinet, which would otherwise be rather tippy. (In fact,

ALAN MARCH

Before deciding to call Australia home, March Audio's founder, Alan March, had been working for Rolls-Royce Aeronautical for almost 20 years in a role that saw him travel around the world recording noise, vibration and other data on everything from the Joint Strike Fighter in the United States to the Concorde in France. A few years ago, he and his wife decided they wanted a sea change and that Australia was the place to do it.

The pair chose the state of Western Australia as their new home because it has more engineering opportunities than anywhere else in Australia due to the number of mining companies based there. Indeed, Alan isn't the only engineer in the marriage; his wife is a civil engineer. So Alan switched from measuring noise and acoustics in aeroplanes to analysing the vibration and noise of the gas turbines and motors used in mining equipment… until he tired of the fly-in/fly-out lifestyle and decided to start his own business manufacturing hi-fi equipment. He first manufactured amplifiers before turning his attention to loudspeakers.

This career change was not actually a big leap for Alan because he had been passionate about music and hi-fi equipment since his teenage years, during which he owned many of the 'classic' audio components made by the likes of NAD, Naim, Meridian and one of his favourites, TAG McLaren. So it was hardly surprising that Alan decided to marry his engineering abilities with his love of music and begin building hi-fi equipment for a living.

the speakers I was supplied for this review were the demo pair made especially for the Australian Hi-Fi Show in Sydney whose bases were not fitted with threaded inserts, so I had to improvise elevated outriggers to conduct this review.) My sample also came without speaker grilles, but this is standard because March says the overall performance — especially dispersion — is superior without them. However, if you (or your significant other) would prefer them with grilles, March Audio will supply them for free. These grilles are small circular types that affix to the drivers magnetically, so you would get two grilles per speaker.

The rear of the Ukkonen AWG cabinet is completely bare save for a single pair of ETI Research speaker binding posts, which ETI describes as being made from 'Kryo tellurium copper with silver plating'.

CABINET FINISHES

Your Ukkonen floorstanders can be painted in any colour you like. The speakers I loaned for review were finished in Candy Red (as pictured), but March Audio prefers customers to order a colour from the RAL colour gamut. 'RAL' is an abbreviation of the German title 'Reichs Ausschuß für Lieferbedingungen und Gütesicherung', which means 'National Commission for Delivery Terms and Quality Assurance', and is a colour matching system that defines colours for paint, coatings and plastics.

Administered by the RAL Deutsches Institut für Gütesicherung und Kennzeichnung, located in Germany, it enables the precise matching of hundreds of colours, each identified by a unique four-digit RAL code. To determine the colour you want, purchase a RAL colour fan ($33 from www.ralcolours.com.au), which shows all the 'RAL Classic' colours available in exactly the shade you will get when you order your speakers. You then advise March Audio of your chosen colour's RAL code and — voilà— that's the colour your speakers will be delivered to your door in. (Carmine Red is RAL3002, for example). You can also order the Ukkonen in a solid wood finish, and some of the timbers available include Jarrah, Blackbutt, Wandoo, Tasmanian Oak, Baltic Birch Play, and Tasmanian Blackwood.

Purifi's driver promises 'uncompromised midrange performance' and '"Real" long-stroke performance with distortion remaining low over full excursion'

The final cost of any Ukkonen AWG pair will depend on your desired finish, but regardless of which you choose they will not be available ex-stock as they are specially manufactured to order. March Audio says the current lead time is approximately four weeks. If you aren't fussy about a specific finish, models are occasionally available for immediate delivery.

IN USE AND LISTENING SESSIONS

Just as I do not expect to hear deep bass from any small bookshelf loudspeaker, I confess that I also don't expect to hear deep bass from any largish floorstander. So I really wasn't expecting the amount of truly deep — dare I say thunderous? — bass that came out of the March Audio Ukkonen, nor its surprisingly pristine purity — particularly given that there's only a single mid/bass driver of relatively modest diameter in each cabinet. Quite simply, I have never (ever!) heard so much high-quality deep bass from any equivalently sized driver, and rarely even from much larger drivers.

The impressive depth of, and equally impressive lack of distortion in, the bass sound is obviously largely due to the unique design of the Purifi PTT8.0X04-NAB-01 driver that is doing all the heavy lifting, but March Audio's cabinet design clearly plays a huge part in the lift too — not only in its volume, dimension and front-firing reflex slot but also the fact that it is almost completely free of resonances due to the company's construction methods.

When I listened to one of the great lounge jazz albums of all time, Quincy Jones' 'Walking in Space', it was enormously satisfying to hear Ray Brown's fabled walking bass line front and centred from the first track, *Dead End*. The tonal accuracy delivered by the Ukkonen was exceptional, as was the accuracy of the pitching — you hear the fundamental pitches instantly and perfectly, there are no pitching machinations. On the title track that follows, Brown's bass lines are more in the background, but this simply offers an opportunity to hear the speakers' superb rendition of not only the sound of the drum but also that of the brass (indeed the musicians on this album include Freddie Hubbard, Snooky Young, J. J. Johnson and Alan Raph, amongst other luminaries), as well as Valerie Simpson's ethereal voice.

Killer Joe also highlighted the unique sonic signatures of the musicians, but here I could also clearly hear the Ukkonen creating that mystical 'space' communicated by all superior-sounding loudspeakers. It also allowed me to appreciate the Ukkonen's beautiful reproduction of high frequencies, thanks to the lovely flute lines of Hubert Laws, who can also be heard playing his more usual instrument (tenor sax) on this album. *Love and Peace* is a great opportunity to hear some great electric guitar sound, and you don't have to be a drummer to appreciate the insane syncopation from Bernard Lee 'Pretty' Purdie, whose signature use of triplets against a half-time backbeat is now known as the 'Purdie Shuffle'. (If you've heard Steely Dan's *Babylon Sisters*, you will already have heard Purdie himself playing a variation of it.)

There's plenty of space and deep bass on Julia Holter's newest album, 'Something in the Room She Moves' (and yes, she credits the Beatles for the inspiration), not to mention wonderful sax, clarinet, flute and piccolo sounds that allowed me to evaluate the Ukkonen's midrange and high-frequency performance while I marvelled at the bass (opener *Sun Girl* is a standout!) Holter is a wonderfully creative composer, her sonic soundscapes (which include 'found' and 'manufactured' sounds as well as synthesised and true instrumental) are intellectually intriguing as well as aurally beautiful. Her own voice is also a glorious instrument, its sound unique in a world of increasingly 'samey' female vocalists (evidenced throughout the album but don't miss the title track or *Meyou* or *Who Brings Me*). The album is a studio creation and the production values are up there in the stratosphere. Is it as good as her 2015 album 'Have You In My Wilderness'? I think it is better.

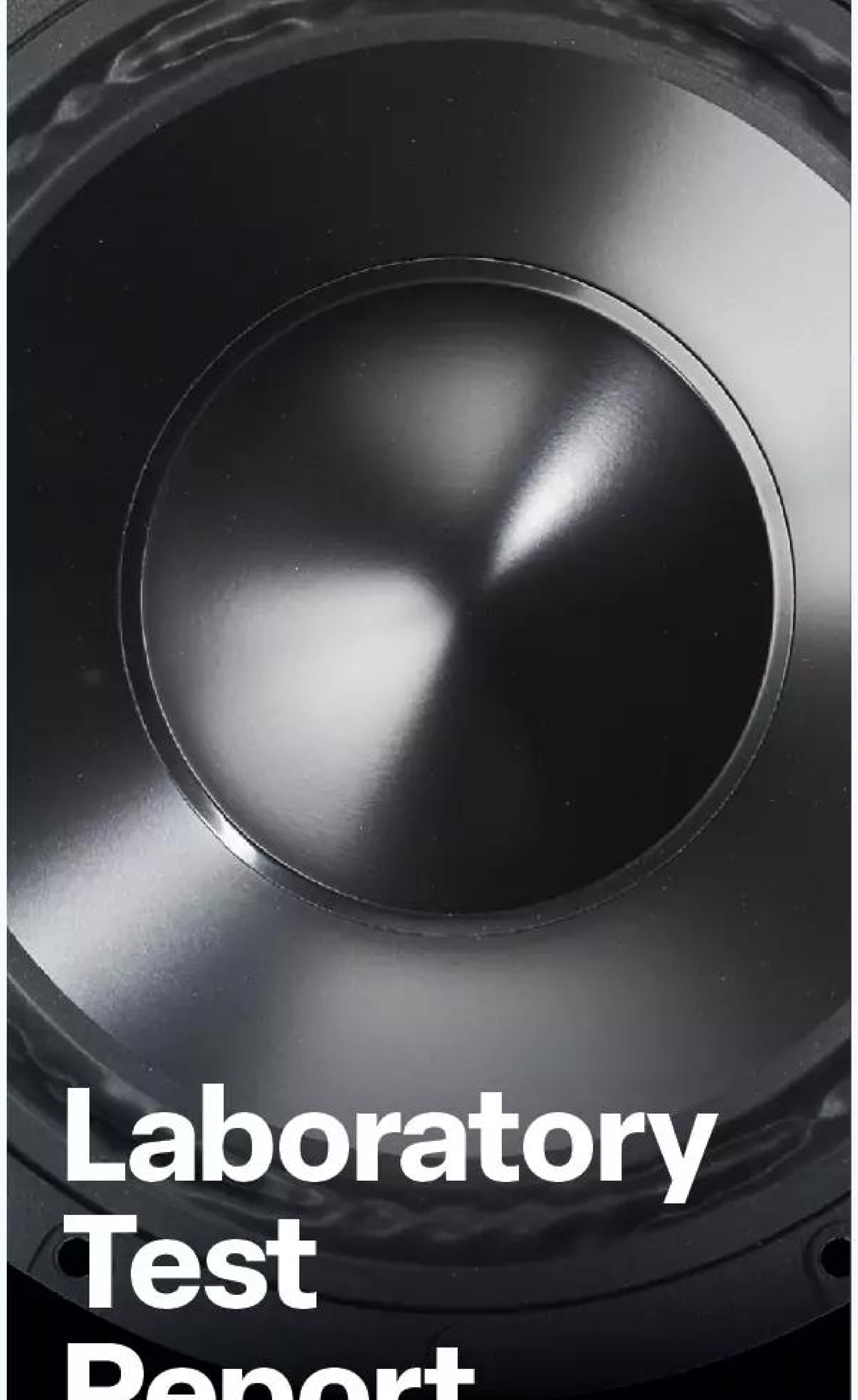
CONCLUSION

March Audio's new Ukkonen loudspeakers sound absolutely superb. The depth, breadth and extension of the sound will take your breath away. Your only problem might be being able to experience all this amazingness because at the time of writing you have to fly to Western Australia to hear a pair. The good news is that Alan March is in the process of finalising an arrangement to have the Ukkonen (and his smaller Sointuva loudspeakers) available for audition in Sydney and Melbourne — maybe even by the time you're reading this review. I, for one, certainly hope this will be the case, but in the event that it isn't, the Ukkonen sound so good that you may well find an audition is worth the price of an airfare. ***Greg Borrowman***

TECH SPECS & CONTACT

Brand: March Audio
Model: Ukkonen AWG
RRP: From $10,000
Warranty: Five years
Frequency response: 32Hz – 20kHz ±1.5dB
Low freq response: 28Hz (–3dB); 24Hz (–6dB)
Nominal impedance: 6 ohms
Minimum impedance: 3.6 ohms @150Hz
Sensitivity: 85dBSPL @ 1M @ 2.83V
Dimensions (HWD): 105 x 28 x 26cm
Weight: TBA

Distributor: March Audio
Address: Suite 1356, 24 Sanford Road Centennial Park WA 6330
T: (04) 4794 6771
E: alan@marchaudio.com
W: www.marchaudio.com



Laboratory Test Report

Readers interested in a full technical appraisal of the performance of the March Audio Ukkonen AWG loudspeakers should continue on and read the LABORATORY TEST REPORT published on the following pages. Readers should note that the results mentioned in the report, tabulated in performance charts and/or displayed using graphs and/or photographs should be construed as applying only to the specific sample tested.

Newport Test Labs first looked at the in-room response of the March Audio Ukkonen, with the speakers distant from any room boundary (except the floor!) and using pink noise as the source. The measured result is shown in Graph 1, where you can see that the response extends from 16Hz to 20kHz ±6dB. This level of bass extension is extraordinary for any two-way loudspeaker system… or any three- or four-way design for that matter. Narrow the level window to look at a smaller, industry-standard ±3dB envelope, and the response is 20Hz to 13kHz, so only the very highest frequencies do not fit into that smaller window.

Newport Test Labs examined the Ukkonen's high-frequency response in more detail using a gated sine technique, the result of which is shown in Graph 2, where the high-frequency response has been spliced (at 1kHz) via post-processing to the room response. You can see that this response shows dips in output at around 13kHz and between 16kHz and 20kHz. The higher

> The bass extension of the Purifi driver is exceptional, its output not rolling off appreciably until 38Hz

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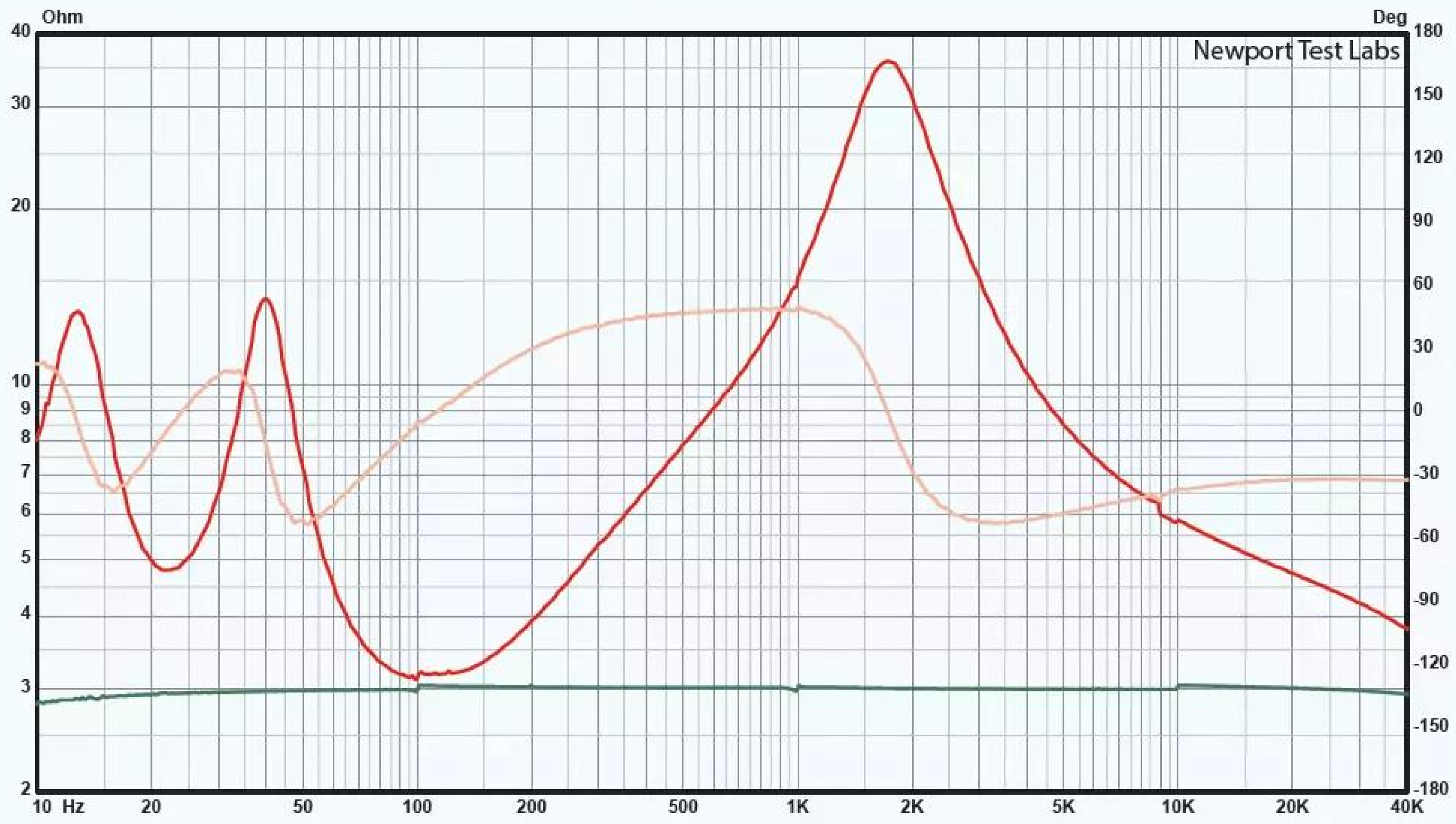
A loudspeaker that Dave Wilson would have built if he had the resources then that Wilson Audio now possesses.

Graph 1. Frequency response (in-room) at one metre, on tweeter axis.

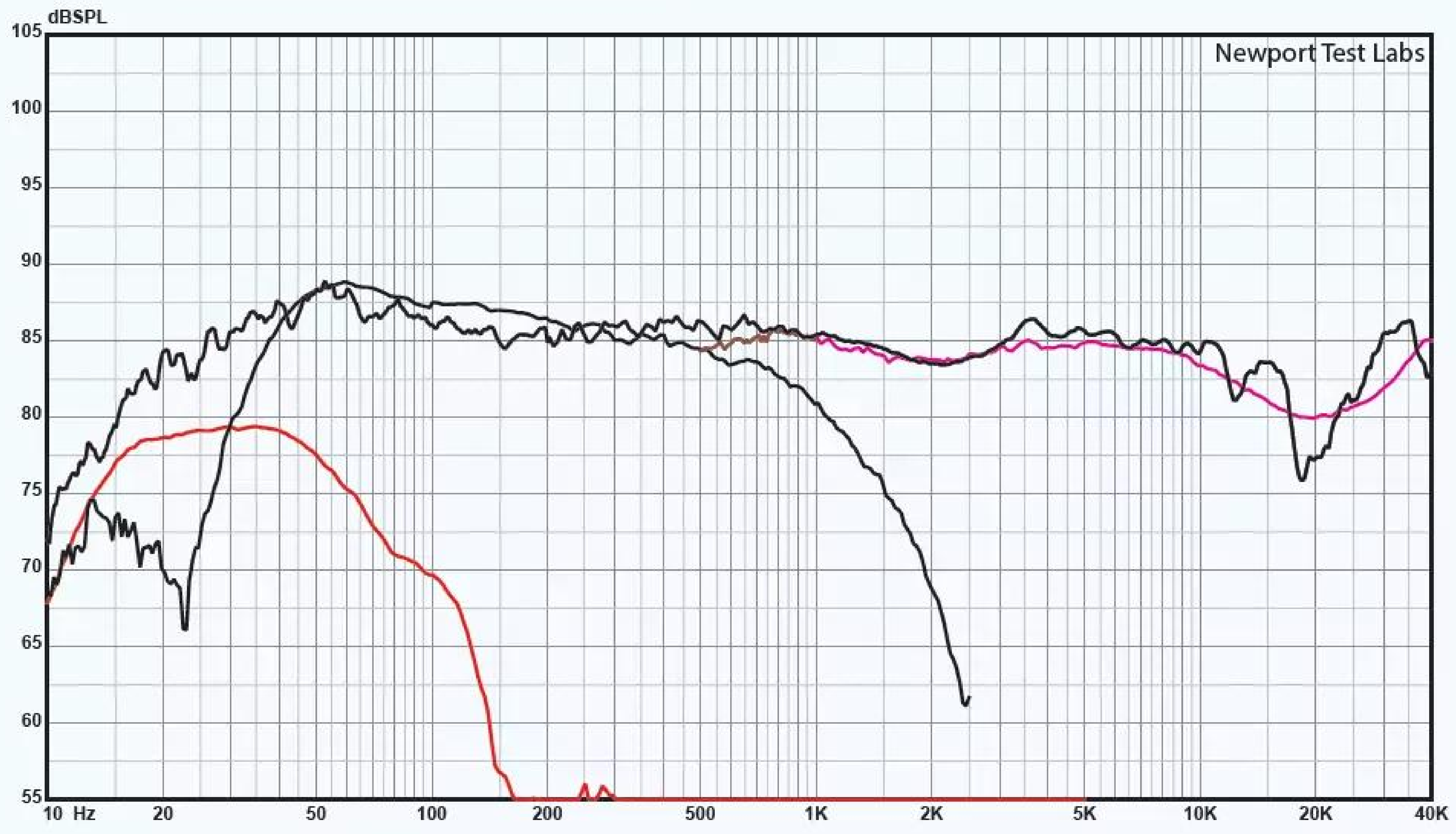
Graph 2. Frequency response with in-room response spliced to anechoic (gated) response at 1kHz.

Graph 3. Nearfield response of port (red trace) and nearfield response of mid/bass driver, with far-field tweeter.

Graph 4. Nearfield low-frequency responses of slotted port (red) and mid/bass driver. No port compensation.



Graph 5. Impedance (red trace) and phase angle (orange trace) vs frequency. Green trace is reference 3-ohm resistor.



Graph 6. Composite frequency response (see copy).

of these two dips was completely expected because it is almost identical to the response SB Acoustics shows in its data sheet for the Satori TW29BNWG-8. The smaller dip isn't explained as easily but it is sufficiently narrow in bandwidth and sufficiently high in frequency that it would not be identifiable as a dip when listening to music, as evidenced by the smooth high-frequency roll-off shown in Graph 1.

Graph 3 is another post-processed graph, this time showing the nearfield response of the mid/bass driver and the front bass-reflex port (red trace) spliced to the gated high-frequency response. Again, the bass extension of the Purifi driver is exceptional, its output not rolling off appreciably until 38Hz, at which point the slot's output is at its maximum to compensate. Note that the slot has considerable acoustic output from 15Hz right up to 60Hz, and that there are no unwanted 'leaks' higher up the frequency spectrum. Graph 4 shows this excellent performance in greater detail.

The impedance modulus and phase angles of the March Audio Ukkonen, as measured by *Newport Test Labs*, are shown in Graph 5 as the red and orange traces respectively (the green trace being a contemporaneous measurement of a precision 0.5% three-ohm resistor included for graph calibration purposes). Here we see a minimum impedance of around 3.2 ohms at 100Hz. Although slightly different from the specification, the differences are not great and could be due to the on-test pair being an early demo model rather than an actual production sample, although given that these speakers are built to order, 'production sample' doesn't really apply. That said, the overall impedance is such that I'd prefer to consider the 'nominal' impedance as being four ohms rather than six.

Newport Test Labs measured the sensitivity as 85dBSPL at one metre for a 2.83Veq input, which is exactly the same as March Audio's specification but does mean that the Ukkonen's efficiency is a little below the average for floorstanding designs, most of which are at least 2-3dB more efficient. You should, therefore, ideally use a more powerful amplifier to drive them — though any competently designed amplifier rated with a power output of more than 90 watts per channel into eight ohms will be powerful enough to ensure realistic playback levels in any ordinary sized listening room and undistorted peak playback levels of at least 105dBSPL. ***Steve Holding***

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Bowers & Wilkins

Bowers & Wilkins 606 S3

Loudspeakers

- Stunning clarity and detail
- Big, open, punchy sound
- Good looks

- Need a little space to breathe

RRP **$1,499**

Good hi-fi needn't cost the earth, and that is especially true when the company manufacturing said hi-fi has a long, illustrious and award-winning history and decides to bestow its higher-end technologies into lower-costing products. That's been the case with Bowers & Wilkins' legendary 600 Series loudspeakers for years, and it has been all the better for it. There are rave reviews throughout the range's 20-plus-year history, so any new generation has quite a lot to live up to.

So here we have the latest iteration, coming some four years after the last (the highly decorated 606 S2 Anniversary Edition). With the 606 S3 standmounts, B&W promises a "more open, neutral performance that delivers voices and instruments with precision and transparency". The brand aims to deliver that primarily through a continuation of its much-loved, proprietary Continuum mid/bass driver and an all-new titanium dome tweeter that makes its debut here. At a modest $1,499 a pair, the 606 S3 already appear to have many of the ingredients in a recipe for success.

DESIGN & BUILD

The 606 S3 are the larger of two standmounts in the 600 S3 series (the smaller 607 S3 aren't just more compact but also sport a smaller mid/bass driver) and largely retain their minimalist look from the previous S2 AE. Indeed, on the literal face of it, not a lot has changed between generations, although anyone familiar with the S2 will undoubtedly be drawn to the different tweeter first.

The new 25mm titanium unit, fitted across the entire 600 S3 series, is a two-part construction — a thin main dome braced by a titanium ring which is housed in a longer tube-loading system that aims to further reduce the amount of unwanted radiation from the back of the tweeter affecting the sound. B&W has previously used titanium in the drivers for soundbars used with Philips TVs, but it's the first time the material has been used in its stereo loudspeakers. The new material should improve resolution and refinement, says B&W.

The tweeter is complete with a new mounting plate to aid dispersion, plus a new grille that was inspired by the top-of-the-range 800 Signature Series and designed to offer greater transparency and refinement.

Its pairing with the 16.5cm mid/bass cone, which benefits from having a more powerful motor assembly behind it, certainly makes for a striking baffle. The two drive units are now positioned closer together on the fascia, too, to improve stereo imaging and the integration between them.

The build quality is of a good standard for this level, with crisp edges, minimal fascia and a smooth finish that makes the speakers look smart overall, no matter the colour option. Speaking of, four colourways are available: all-black, all-white, oak (which is more 'oak sides with a white fascia') and red cherry (which is actually 'red cherry sides with a black fascia').

It is a different story both around the back of and inside the speaker cabinets, as Bowers' engineers have tinkered away and made several changes over the preceding range, many of which have been directly taken from its next-range-up 700 S3 in the process. Highlights include a new crossover with higher-quality bypass capacitors; a vastly different speaker terminal layout which I expect will sit well with most customers; and a bass reflex port that is, at least looks-wise, better separated from the aforementioned speaker terminals. The internal bracing inside the cabinet has been strengthened by upgrading the wood used, too. The goal of all this tinkering: to offer a cleaner and more open sound with minimal distortion throughout.

Naturally, given their standmount size and nomenclature, you're going to want to place them on a quality set of speaker stands, and Bowers & Wilkins would naturally point you in the direction of its dedicated $499 FS-600 S3 stands. They come in black or silver to match your chosen speaker aesthetic and are relatively simple to assemble. They are hollow with the inclination to be filled with sand. I didn't have any sand to hand — Bondi was a train journey too far during the depths of winter! — but they nevertheless felt secure and solid with the speakers in position. You'll find four screw holes on the bottom of the 606 S3 to securely fasten them to the stands' top plates.

LISTENING SESSIONS

If you're looking for a quick answer to how these Bowers & Wilkins standmounts sound, then here it is: I was blown away by just how clear and detailed the sound produced by B&W's latest 606 was, no matter the genre. There you have it.

I performed the majority of my listening sessions with the 606 S3 connected to Marantz's Model 50 integrated amplifier and

Model CD50n CD-playing network streamer — a natural pairing indeed and one that is no stranger to acclaim. The majority of music was played via Amazon Music, in 24-bit/96kHz quality wherever applicable, within the HEOS app, and I dusted off a few CDs for the occasion too.

I selected a wide range of songs, from Dua Lipa's spick and span *IDGAF* through to Joni Mitchell's glorious *Both Sides Now*, and each and every time the 606 S3 performed with absolute confidence. Vocals and drumbeats started and stopped when they were meant to, with dead-on precision to my ear, while dynamic variations were handled in a surprisingly organic manner.

I cranked up both the music tempo and volume, and the Bowers bookshelves were more than happy to keep pace. I found myself foot-tapping away and getting lost in my favourite songs all over again, whether it was listening to resident Australian DJ Dom Dolla or virtually any track on Lady Gaga's 'Chromatica' album. The speakers never let the pulsing beats get ahead of them, but instead took them in their stride.

The impressive size, dimension and openness of their soundstage belied their cabinet size, too, and the spaciousness within it was such that instruments appeared to breathe freely and have head – and elbow – room to flourish. Nine Inch Nails' *Right Where It Belongs* is a fantastic test of how loudspeakers can communicate spatial production changes, and indeed the 606 S3 deftly conveyed the shift from a small, intimate studio recording to the vast, crowd-cheering atmosphere of a live performance in the final chorus. That substantial mid/bass driver and deep cabinet combine to deliver weight, punch and authority, too, with orchestral pieces roaring with conviction as I pumped them at volume.

The delightfully named *Mopedbart* by the equally quirky Hubbabubbaklubb offered more proof of the 606 S3's stereo imaging prowess. Guitars were placed distinctly to the right, and what I'm convinced is a cowbell was fixed to the left, while vocals and keyboards took centre stage. Nothing sounded like it was blurring into anything else.

I experimented with placement and found the 606 S3 performed at their true best with a decent amount of space between them and the rear wall so that the rear bass port (and that airy sense of space) wasn't obstructed.

CONCLUSION

If you haven't already guessed (!), I love the Bowers & Wilkins 606 S3. They are supremely talented standmounts that won't for a moment hold back price-suitable source components such as those I used during my testing. They will perform at their optimum when placed upon their (or other) dedicated stands, but if push comes to shove just be sure that whatever surface you sit them on is sturdy and rigid.

I wasn't sure how B&W was going to improve upon the previous generation, which still pulled its weight despite its age, but boy has the company managed it. If — or likely, when — an S4 series goes into production, I'll waste no time in joining the queue to hear them. But honestly, I'm in no hurry to replace the 606 S3 one bit.

Max Langridge

600 S3 Series at a glance

603 S3 floorstanders $3,499/pair
- 25mm Titanium Dome tweeter
- 150mm FST Continuum Cone midrange unit
- 2 x 165mm paper cone bass drivers

607 S3 standmounts $1,149/pair
- 25mm Titanium Dome tweeter
- 130mm Continuum Cone mid/bass

HTM6 S3 centre channel $1,149
- 25mm Titanium Dome tweeter
- 2 x 130mm Continuum Cone mid/bass

TECH SPECS & CONTACT

Brand: Bowers & Wilkins
Model: 606 S3
RRP: $1,499
Warranty: Five years
Type: Two-way vented-box standmounts
Drive units: 25mm titanium dome tweeter; 16.5cm Continuum mid/bass
Bi-wire: Yes
Recommended amplifier power: 30-120W (into 8 ohms)
Nominal impedance: 8 ohms
Frequency range: -6dB 40Hz - 33kHz
Sensitivity: 88dB
Dimensions (HWD): 34.4 x 18.9 x 30cm
Weight: 7.05kg
Finishes: White, black, oak, red cherry

Distributor: Masimo Consumer Australia
Address: 86 Peters Avenue
Mulgrave, VIC 3170
T: 03 8542 1111
W: www.bowerswilkins.com/en-au/

EISA AWARDS

2024-2025

Australian Hi-Fi magazine is a long-time member of the worldwide Expert Imaging and Sound Association (EISA) community, which is formed of expert reviewers from 58 technology magazines and websites specialising in hi-fi, home theatre, mobile and in-car electronics, photography and video from 29 countries around the globe. Each year, EISA members rally together to judge the best product of the year in each field through webinar presentations followed by listening sessions, extensive laboratory testing and nominations, shortlists and a final voting session. The manufacturers of winning products are presented with a coveted EISA Award at the annual EISA Gala Ceremony, which last year took place at the famous Ascot Racecourse. On the following pages are all the winners in the 2024–2025 EISA Award Hi-Fi category, information on where you can find them in Australia, and a full list of the prizewinners in the other categories.

EISA TURNTABLE 2024-2025

Pro-Ject XA B

There's something magical about seeing your vinyl records spinning above the clear acrylic plinth of the XA B. Fielding multiple Pro-Ject technologies and built in Europe, this is a striking turntable — and a very capable one. The XA B's inert chassis houses clean power circuits, an electronic speed control and a sub-platter with extremely tight bearing tolerances, all enabling smooth, reliable performance. A high-quality Pick it Pro Balanced cartridge is pre-mounted on a 10-inch tonearm for ease of use, resulting in engaging sonics without setup anxiety. And with the cartridge and the mini-XLR (balanced) output providing an upgrade path, the XA B is an excellent choice for vinyl lovers now and for the future.

EISA STREAMING PREAMPLIFIER 2024-2025

NAD Masters M66

With the M66, NAD has given audiophiles a preamplifier that's a fit for both streaming and vinyl playback — and a fine match for the mighty M23 power amp of its flagship Masters series. A host of connections, including HDMI ARC and dedicated MM and MC phono inputs, gives the M66 the flexibility to stand out in a crowded market, as does its 175mm touchscreen display; control NAD's preamp here, or through the refreshed BluOS app with its multitude of streaming services. To top it off, the M66 supports connection of up to four subwoofers, expertly integrated through Dirac Live Bass Control. This opens the door to a huge sonic performance leap, taking an already fine-sounding DAC/streamer/preamp to another level.

EISA STREAMER 2024-2025

Eversolo DMP-A8

It's not often a product arrives that redefines its category, but Eversolo's DMP-A8 streamer does exactly that. Inside its slender aluminium housing, the latest dual-chip AKM DAC solution is married to a high-quality R2R volume control, making it a capable preamplifier, while an array of inputs and outputs — from balanced analogue to USB-B — handle source and amp connection. At the core of the DMP-A8 is a flexible, Android-based OS with built-in streaming services, excellent file format support and advanced DSP possibilities, expandable with further third-party apps – all displayed on a lavish colour touchscreen. However you use Eversolo's streamer, your music will sound and look great!

EISA STREAMING AMPLIFIER 2024-2025

Rotel RAS-5000

By embracing modern streaming and usability features but not straying from its manufacturer's 'performance-first' ethos, the RAS-5000 is a desirable addition to Rotel's range — and the streaming amp market as a whole. A confident driver of loudspeakers courtesy of its rated 2x140W Class AB output, the RAS-5000 tackles all music genres with a sonic signature showcasing a powerful yet smooth, balanced approach. Versatile connectivity also impresses, with digital inputs including HDMI eARC, USB-B and Wi-Fi/Ethernet feeding its high-quality DAC stage. Playback is a breeze, either through Rotel's own app, a DLNA player, or Roon, and icing the RAS-5000 cake is the amp's meticulous build and informative colour display.

EISA PREMIUM STREAMING AMPLIFIER 2024-2025

Hegel H400

This beautifully engineered amplifier takes its cues from Hegel's earlier H390, making improvements to its streaming platform, DAC and preamp stages — plus introducing app control — to deliver a streaming amp of undeniable appeal. As we've come to expect from the Norwegian marque, the H400's power output proves prodigious, making this an accomplished driver of 'hungry' loudspeakers, while its natural, transparent sound signature brings your music to life with ease. No genre is off limits, and with streaming options including Tidal Connect, Google Cast, UPnP and Airable radio/podcasts (plus the H400's range of wired inputs) you'll have no difficulty finding something to play.

EISA COMPACT STREAMING AMPLIFIER 2024-2025

Marantz MODEL M1

Don't be fooled by the MODEL M1's diminutive size and minimalist design. Thanks to its 2x100W digital Class D power stage and wide-ranging feature set, Marantz's compact amplifier effortlessly drives loudspeakers to take care of both music and TV audio needs. Integration of the HEOS streaming platform and control app, plus AirPlay 2 and Bluetooth connectivity, make music playback easy, while HDMI eARC, Dolby Digital decoding and subwoofer support cater to movie nights via a 2.1 system. And although the MODEL M1 fits many roles — the compact form factor also suits CI set-ups — this amplifier's superb sonic performance stays true to Marantz's heritage.

EISA ENTHUSIASTS AMPLIFIER 2024-2025

Musical Fidelity A1

Musical Fidelity's A1 integrated amplifier takes music lovers on a journey back in time, resurrecting the distinctive, slender-chassis styling and much of the under-the-hood design of the company's celebrated 1980s original. This remains an all-analogue amp with MM/MC phono, line-in and tape loop connections, but now benefits from carefully considered upgrades to its power supply and internal heatsinking, and adds a welcome Direct mode that bypasses the preamp gain. Otherwise, this 2x25W Class A unit picks up where its predecessor left off — notable for an organic, almost tube-like presentation that delivers music in a thrillingly expansive, expressive fashion.

EISA INTEGRATED AMPLIFIER 2024-2025

HiFi Rose RA280

Since its arrival on the hi-fi scene in 2017, HiFi Rose has seduced audiophiles with a range of products that combine high-quality engineering and performance with a unique sense of style. The RA280 analogue integrated amplifier is no exception, its elegant casework with tactile front-panel controls (and VU meters) concealing an innovative GaN FET-based Class D amp stage that comfortably outperforms its 2x250W specification. In use, via either its balanced line input or moving-magnet phono stage, the RA280 dazzles with detailed, airy stereo imaging and a dynamic, exciting sound that'll have you cranking up its illuminated volume dial. HiFi Rose's amplifier punches far above its price tag.

EISA BEST VALUE STREAMING AMPLIFIER 2024-2025

WiiM Amp

A new entrant to the 'just add speakers' arena, the WiiM Amp catches the eye with its neat, easy-to-house casework and affordable price, and then stuns with its multi-talented feature set and performance. Streaming skills are extensive, from Spotify/Tidal Connect to playback through Roon, DLNA, AirPlay and the WiiM Home app — choose your music, and this diminutive amplifier then offers a big-hearted performance, based around its 2x60W Class D amp stage and ESS Sabre DAC. Want more? The WiiM Amp offers voice control, a USB port for external storage, two-way Bluetooth for headphone listening, HDMI ARC connectivity and in-depth EQ settings via the app. In short, this is a little box with a lot of appeal!

EISA PREMIUM ALL-IN-ONE SOLUTION 2024-2025

T+A R 2500 R

Traditional hi-fi 'lore' states that the best sound performance requires separates. T+A's R 2500 R, however, says otherwise. This all-in-one amplifier is an unashamedly premium product, relying on dual-mono Class AB amplification, a custom PSU, and dual DAC architecture — where DSD inputs are separately handled by a bespoke 1-bit converter — to deliver your music with power and finesse. It's a genuine multi-source unit too, letting you play CDs, kick back with FM/DAB+ radio or stream content via T+A's user-friendly app or the R 2500 R's integration of Roon. Meanwhile, comprehensive connectivity, including HDMI inputs and ARC, USB DAC, headphone out and Bluetooth streaming, make it ready for any user scenario.

EISA PREMIUM SOUNDBAR 2024-2025

CANVAS Hi-Fi, CANVAS

At first glance the CANVAS appears akin to a conventional soundbar, but it's far more than that. Designed to be used both with a TV or as a standalone hi-fi system, it combines its stereo driver array and four-way amp stage with innovative BACCH 3D crosstalk cancellation, for a performance that delivers your favourite music or movie content on a grand scale with authentic imaging. Features include room correction, wireless streaming and HDMI eARC, and it's customisable too, with a decorative front panel available in a choice of wood or textile finishes. This can be specified in sizes to match TV screens from 55 to 77 inches, while CANVAS's hybrid mount supports both on-wall and floor mounting.

EISA PREMIUM WIRELESS BOOKSHELF LOUDSPEAKERS 2024-2025

Triangle Capella

Triangle's Capella offers audiophiles a high-quality, one-stop solution by partnering its set of wireless bookshelf/standmount speakers with a WISA Stereo Hub that's pre-paired to make setup a breeze. The 24-bit/192kHz Hub manages sources both wired and wireless — from USB and HDMI ARC to Bluetooth, AirPlay, Chromecast and DLNA — for playback from the Capella's powered, two-way cabinets. The sound is notable for the broad, smooth dispersion of Triangle's horn-loaded alloy dome tweeter, and its rich, controlled bass delivery; app-based manual and automatic EQ can be employed if desired. Finish options, including striking Astral Blue and Brown Nebula, are as smart as the Capella system itself.

EISA PREMIUM LOUDSPEAKER 2024-2025

SVS Ultra Evolution Pinnacle

The top-of-the-range loudspeaker in SVS's Ultra Evolution series is a real statement of intent from the American manufacturer. By showcasing a new time-aligned cabinet architecture, improved diamond vapour-coated tweeter design, and no fewer than four 200mm bass drivers configured in 'force-balanced' pairs, the Pinnacle floorstander has all the hallmarks of a flagship model. So does its performance. Aided by attention to detail in cabinet construction and bracing, including 25mm-thick front and rear baffles, the Ultra Evolution Pinnacle crafts huge, atmospheric soundstages that are underpinned by deep, energetic bass and peppered with detail — all without being too demanding of partnering amplification.

EISA BEST VALUE WIRELESS BOOKSHELF LOUDSPEAKERS 2024-2025

PSB Alpha iQ

Designed with both performance and ease of use in mind, PSB's Alpha iQ is the first active stereo speaker system to incorporate the BluOS platform, tying it into a multiroom ecosystem with slick app control and music playback options. With further connections including AirPlay, aptX HD Bluetooth, HDMI ARC and MM phono, the Alpha iQ accommodates a modern mix of wired and wireless sources, while its performance is equally crowd-pleasing. The two-way driver arrays in each compact cabinet, allied to independent built-in amplification, deliver a detailed, even-handed sound. Choose PSB's black or white finish for a discreet install or make the Alpha iQ the centre of attention through one of three bright colourways!

EISA FLOORSTANDING LOUDSPEAKERS 2024-2025

Monitor Audio Gold Series 300 6G

Monitor Audio has leveraged technologies from its higher-end Platinum 3G and Hyphn models to deliver a comprehensive upgrade of its Gold 300 floorstander. Chief among its new features are C-CAM midrange and bass drivers now with Hexagonal Diaphragm Technology (HDT) to improve rigidity, and Monitor Audio's distinctive Micro-Pleated Diaphragm III tweeter. The latter's detailed, extended treble adds a sense of air to the Gold 300 6G's full-bodied midrange and deliciously deep bass — it's an addictive sound that'll ensure listening sessions fly by. Aesthetic design is gold-standard too, with this slender floorstander looking resplendent in gloss black, satin white or man-made ebony veneer options.

EISA PREMIUM LOUDSPEAKER SERIES 2024-2025

Bowers & Wilkins 700 S3 Signature

Three models from Bowers & Wilkins' 700 S3 series receive a Signature upgrade, resulting in high-performance loudspeakers to entice both hi-fi and home theatre enthusiasts. Shared across the 702 S3 Signature tower, 705 S3 Signature standmount and HTM71 S3 Signature centre are new crossover networks and terminal plates, improved driver suspensions, and a remodelled tweeter grille derived from the brand's flagship 800 D4 Signature line. Joining these carefully considered upgrades are gorgeous Datuk Gloss and Midnight Blue Metallic finishes so that the 700 S3 Signature speakers look as good as they sound: lively and dynamic, with effortless imaging and fine-touch detail. For stereo music or 5.1 movies, this series delivers!

EISA PORTABLE LOUDSPEAKER 2024-2025

Morel Biggie

With its playful name and wide selection of colour finishes, Morel's Biggie is a wireless loudspeaker with a fun side. But while small in stature and easily portable thanks to its leather-style carry handle and built-in rechargeable battery, its two-way driver configuration — 25mm tweeter and 100mm woofer, each with dedicated amplification — delivers a large-scale, powerful sound. Useful features include True Wireless Stereo (TWS) to pair two Biggies in a discrete two-channel system, fast charging via USB-C connection, and support for Bluetooth Auracast. Design impresses too, with the Biggie's illuminated controls making setup easy and keeping you up to date with battery status.

EISA HIGH-END LOUDSPEAKERS 2024-2025

Wilson Audio The WATT/Puppy

By applying new state-of-the-art technologies to the WATT/Puppy design, Wilson Audio has successfully reimagined this most iconic of loudspeakers. The form factor might be unchanged — The WATT/Puppy still mounts an isolated two-way enclosure atop a dual-driver bass section — but so much more is new. The CSC tweeter was first developed for its Alexx V model while the bass and mid drivers are leveraged from the costlier Sasha V. In addition, the crossover network, bespoke cabinet materials, spike assemblies and pin-point adjustability of the head unit are all optimised for this one model. Performance, meanwhile, defies expectations: phenomenal bass control and power, explicit detail, and first-rate musicality. The WATT/Puppy is a triumph of audio engineering.

EISA HIGH-END HEADPHONES 2024-2025

Austrian Audio The Composer

Building on its engineering team's decades of experience in headphone design, manufacturer Austrian Audio has got off to a flying start with this high-performance over-ear model. The Composer's sound suits its name, its custom 49mm Hi-X drivers and open-back housings crafting musical, dynamic and detailed sonics suited to listening at home or in the studio. Comfort is first-rate too, with a lightweight metal frame, smart mesh headband and wide adjustability enabling a perfect fit for hours of use. The accompanying luxury case includes a complete selection of cables, allowing you to savour The Composer's high-end presentation with every DAC/amp straight out of the box. This is a reference headphone to cherish.

EISA HEADPHONE AMPLIFIER 2024-2025

iFi Audio iDSD Diablo 2

If the original Diablo headphone amp from iFi Audio was a breath of fresh air, this second-gen model will blow you away. Upgrades include a mode for MEMS earphones, Bluetooth 5.4 with aptX Lossless, and the latest implementation of iFi Audio's PureWave balanced circuit design, plus a new metallic-red chassis with grooves to support the Diablo 2's desktop stand at different angles. Flexibility impresses, both in terms of functionality (the Diablo 2 will serve as an external DAC/preamp if desired) and headphone compatibility. Use iFi Audio's iEMatch technology with sensitive in-ears, and be rest assured this amp's 4800mAh battery can drive demanding headphones with ease, aided by 'Turbo' and 'Nitro' modes.

EISA PREMIUM WIRELESS HEADPHONES 2024-2025

DALI IO-12

Joining the earlier EISA Award-winning IO-6 in DALI's active noise-cancelling headphone lineup, the IO-12 finds the Danish manufacturer taking a 'True Hi-Fi' approach to music listening on the move. This premium model leverages DALI's knowledge of loudspeaker design, backing its 50mm rigid paper/fibre drivers with a motor system using its custom SMC material, while the latest noise-cancelling and Bluetooth technologies, configured by DALI engineers, refine its performance. A headphone with myriad talents, including hi-res playback via USB-C and a choice of three ANC modes, the IO-12 dispenses fine details, a lavish midrange and impressive bass, guaranteeing you'll always come back for more.

EISA PREMIUM WIRELESS SPEAKER 2024-2025

Meridian Ellipse

Incorporating engineering principles derived from Meridian's DSP8000 XE and DSP9 towers – the standard bearers of its Extreme Engineering Programme — the Ellipse proves high-fidelity is possible from a compact, wireless speaker. Marrying a trio of active drivers to a powerful DSP platform, its performance showcases superb clarity, deep bass and, if required, a room-filling output. Among its streaming options are AirPlay, Chromecast, Spotify Connect and Roon, accompanied by USB, optical and analogue inputs for wired sources. Meridian's Ellipse is therefore impressively versatile, a characteristic mirrored by the suite of sound tuning options in its partnering Control app.

EISA COMPACT DAC 2024-2025

iFi Audio GO Bar Kensei

Combining USB DAC and headphone amplifier technologies in a compact, pocket-friendly design, the GO Bar Kensei is a fit for on-the-go audiophiles. Utilising its USB-C connection for both power and hi-res file playback, iFi Audio's stunning portable delivers a superb performance to headphones, whether IEMs or conventional over-ear designs, via its 3.5mm/4.4mm outputs. Key to this is the GO Bar's high-quality hardware engineering, and the integration of JVCKenwood's K2HD processing to revive the natural sound of digital recordings. A choice of filters and analogue EQ presets are available to further finesse the GO Bar Kensei's sonics, all indicated by status lights on its smart, brushed aluminium body.

EISA AV FURNITURE 2024-2025

Blok Stax 2G

Often overlooked, AV furniture has a crucial role to play in obtaining the best sonic performance from an audio system, be it stereo or multichannel. This is ably demonstrated by the second generation of Blok's Stax, which combines a smart and functional design with isolation and resonance-controlling technologies, housing your system components in the best possible way. The modular approach of Stax 2G makes it easy to build an equipment rack exactly suited to your requirements, while cable management is equally effortless. Adjustable feet mean the often-arduous task of levelling your AV furniture is also a breeze. Available in multiple finishes, Blok's Stax 2G sets the stage for your system's finest performance.

HT AUDIO EXPERT GROUP

EISA AV RECEIVER 2024-2025
Marantz CINEMA 30

EISA HOME THEATRE LOUDSPEAKER SERIES 2024-2025
SVS Ultra Evolution

EISA HOME THEATRE PROCESSOR 2024-2025
Primare SP25 Prisma

EISA HOME THEATRE SOUNDBAR 2024-2025
Samsung HW-Q990D

EISA HOME THEATRE SUBWOOFER 2024-2025
Perlisten R18s

EISA COMPACT SOUNDBAR 2024-2025
Sennheiser Ambeo Mini

HT VIDEO EXPERT GROUP

EISA BEST BUY MINI LED TV 2024-2025
Hisense 65U7N

EISA BEST BUY OLED TV 2024-2025
Philips 55OLED809

EISA BEST BUY UST PROJECTOR 2024-2025
Hisense PL2

EISA BEST FAMILY TV 2024-2025
Philips 65PML9009

EISA BEST HOME THEATRE OLED TV 2024-2025
Philips 65OLED+959

EISA FAMILY PROJECTOR 2024-2025
Hisense C1

EISA GAMING TV 2024-2025
TCL 55C765

EISA GIANT TV 2024-2025
Hisense 100E7N Pro

EISA HOME THEATRE MINI LED TV 2024-2025
TCL 75C855

EISA PORTABLE PROJECTOR 2024-2025
XGIMI MoGo 3 Pro

EISA PREMIUM MINI LED TV 2024-2025
Hisense 65U8N

EISA PREMIUM OLED TV 2024-2025
Samsung 65S95D

EISA STATEMENT TV 2024-2025
TCL 115X955 M

IN-CAR EXPERT GROUP

EISA IN-CAR AMPLIFIER 2024-2025
BRAX REVELATION RX2 PRO

EISA IN-CAR DASHCAM 2024-2025
BlackVue DR970X-2CH Box Plus

EISA IN-CAR DSP AMPLIFIER 2024-2025
ESX VE1300.11SP

EISA IN-CAR HEAD UNIT 2024-2025
Sony XAV-9550ES

EISA IN-CAR HIGH-END COMPONENT 2024-2025
ESB Novemila Series

EISA IN-CAR INTEGRATION 2024-2025
Eton UG BMW Ultimate Series

EISA IN-CAR OEM PREMIUM AUDIO SYSTEM 2024-2025
Lotus Eletre with KEF Reference Audio System

EISA IN-CAR PREMIUM UPGRADE 2024-2025
HELIX V EIGHTEEN DSP

EISA IN-CAR SUBWOOFER 2024-2025
Ground Zero GZPW-10SQX

EISA MARINE AUDIO COMPONENT 2024-2025
Hertz Venezia V8 DSP

PHOTO EXPERT GROUP

EISA ADVANCED FULL-FRAME CAMERA 2024-2025
Nikon Z6III

EISA APS-C CAMERA 2024-2025
Sony Alpha 6700

EISA BEST BUY TELEPHOTO LENS 2024-2025
TAMRON 70-180mm F/2.8 Di III VC VXD G2

EISA BEST BUY WIDE ANGLE ZOOM LENS 2024-2025
TAMRON 17-50mm F4 Di III VXD

EISA CAMERA OF THE YEAR 2024-2025
Sony Alpha 9 III

EISA COMPACT CAMERA 2024-2025
Fujifilm X100VI

EISA FULL-FRAME CAMERA 2024-2025
Nikon Z f

EISA LENS OF THE YEAR 2024-2025
SIGMA 50mm F1.2 DG DN | Art

EISA MICRO FOUR THIRDS CAMERA 2024-2025
Panasonic Lumix G9II

EISA PHOTO/VIDEO ZOOM LENS 2024-2025
Canon RF 24-105mm F2.8 L IS Z

EISA PORTRAIT LENS 2024-2025
Nikon NIKKOR Z 135mm f/1.8 Plena

EISA STANDARD ZOOM LENS 2024-2025
SIGMA 28-45mm F1.8 DG DN | Art

EISA SUPER TELEPHOTO ZOOM LENS 2024-2025
Nikon NIKKOR Z 180-600mm f/5.6-6.3 VR

EISA SUPERZOOM LENS 2024-2025
Nikon NIKKOR Z 28-400mm f/4-8 VR

EISA TELEPHOTO LENS 2024-2025
Sony FE 300mm F2.8 GM OSS

EISA TELEPHOTO ZOOM LENS 2024-2025
Sony FE 70-200mm F4 Macro G OSS II

EISA ULTRA WIDEANGLE LENS 2024-2025
Laowa 10mm f/2.8 Zero-D FF

EISA ULTRA WIDEANGLE ZOOM LENS 2024-2025
Canon RF 10-20mm F4 L IS STM

EISA WIDEANGLE LENS 2024-2025
Sony FE 16-25mm F2.8 G

MOBILE DEVICES EXPERT GROUP

EISA AI SMARTPHONE 2024-2025
OPPO Reno12 Pro

EISA CREATOR SMARTPHONE 2024-2025
Sony Xperia 1 VI

EISA SMART RING 2024-2025
Oura Ring

EISA SMARTPHONE 2024-2025
HONOR 200 Pro

EISA SMARTWATCH 2024-2025
Huawei Watch 4 Pro Space Edition

EISA
EXPERT IMAGING AND SOUND ASSOCIATION

Where to find the EISA Award Winners

- Hegel H400 streaming amplifier
- Rotel RAS-5000 streaming amplifier
- Wilson Audio The Watt/ Puppy loudspeakers

▸ **Advance Audio**

- Eversolo DMP-A8 streamer

▸ **Fundamental Audio**

- Pro-Ject XA B turntable
- T+A R 2500 R multi-source receiver
- SVS Ultra Evolution Pinnacle loudspeakers
- Monitor Audio Gold Series 300 6G loudspeakers
- Austrian Audio The Composer headphones

▸ **Interdyn Brands**

- NAD Masters M66 streaming preamplifier
- PSB Alpha iQ wireless bookshelf speakers

▸ **Amber Technology**

Bowers & Wilkins

Marantz

- Marantz MODEL M1 streaming amplifier
- Bowers & Wilkins 700 S3 Signature loudspeaker series

▸ **Masimo Consumer Australia**

- Musical Fidelity A1 amplifier
- Triangle Capella wireless bookshelf speakers

▸ **Audio Marketing**

- Meridian Ellipse wireless speaker

▸ **Cogworks**

- WiiM Amp streaming amplifier

▸ **Audacity Australia**

- HiFi Rose RA280 integrated amplifier
- iFi Audio iDSD Diablo 2 headphone amplifier
- iFi Audio GO Bar Kensei compact DAC
- DALI IO-12 headphones

▸ **BusiSoft AV**

- Blok Stax 2G AV furniture

▸ **Interdyn Brands**

- CANVAS Hi-Fi, CANVAS

▸ **Mail order only in Australia**

- Morel Biggie portable speaker

▸ **Currently unavailable in Australia**

The (R)evolution of Portable Audio – Part 6

Play everything, do everything

It reigns supreme as the audio player of choice today, but as Darren Yates writes, the smartphone itself can trace its lineage back to another handheld computer that also wowed crowds…

The Apple Newton MessagePad pioneered the all-screen handheld computer concept (Image credit: Rama, CC-BY-SA-2.0-FR).

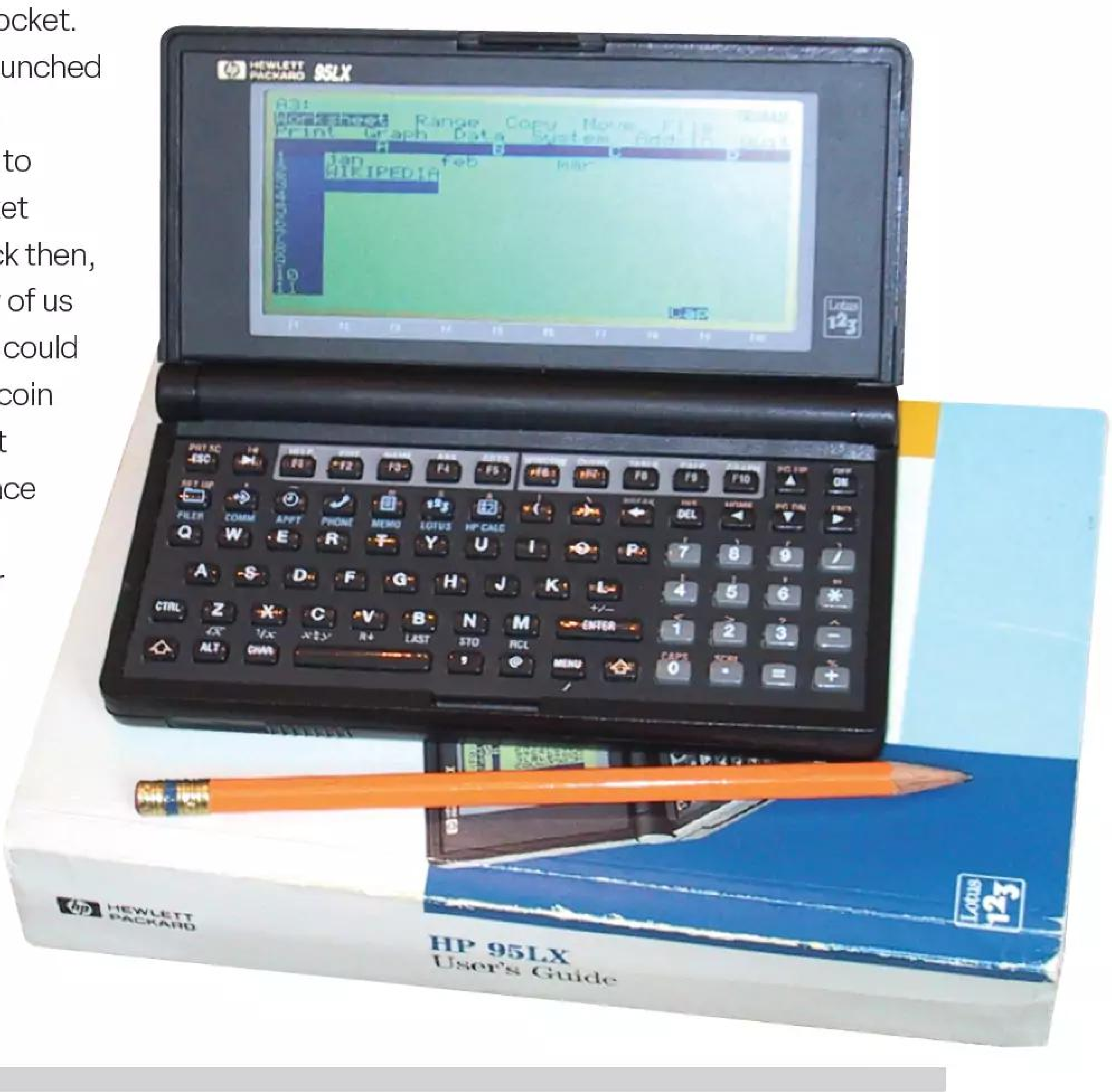
It was the launch of a product the likes of which the world had never seen. Compact and lightweight, its selling point was a computer that fits into your pocket. It amazed all who saw it and launched a whole new class of portable computing. Of course, I'm referring to the Tandy Electronics TRS-80 Pocket Computer and the year is 1980. Back then, computers still filled rooms and few of us had one at home. The idea that you could now run a computer on a couple of coin batteries and slot it into your pocket was science fiction becoming science fact (which is, no doubt, why Tandy Electronics signed up famed author Isaac Asimov to spruik the Pocket Computer in its ads). The launch of the Apple iPhone some 27 years later had an equally transforming effect, on not just digital audio but portable computing as a whole. Yet while the iPhone had its roots in Tandy's 1980 Pocket Computer, its lineage can be followed closer to home in an equally ambitious Apple device from the 80s.

Cradling the Newton

If there's one product you could argue laid more of the foundations for our modern mobile world than any other, it's the Apple Newton. Work began on the device in 1987, but it would take another six long years before it would be ready for market, bringing with it new technologies.

First, the Newton starred a new Reduced-Instruction-Set-Computing (RISC) processor from a small British PC maker with big ideas

The HP95LX delivered a compact DOS-class computer – and a really big user manual.



HP's iPaq HW6910 combined PDA and phone a year before the iPhone hit the market (Image credit: Asim18, CC BY-SA 4.0).

The HP Jornada 720 was a Windows CE handheld computer.

called Acorn Computers. The chip was the ARM610, based on the original 'Acorn RISC Machine' CPU (Acorn would become phone chip design giant ARM). The idea was that bloated Complex-Instruction-Set-Computing (CISC) chips used in PCs weren't necessary and a lean RISC chip could deliver the performance required with much greater power efficiency.

But second, the Newton featured a whole-screen monochrome LCD panel with touch capability and arguably its most innovative feature — handwriting recognition. It was modestly successful (both at handwriting recognition and sales), but after burning through more than US$100million in development, it became one of the first casualties upon Steve Jobs' return to the company in 1997. Nevertheless, despite its overall lack of success, the Newton MessagePad sowed the seeds of technology that drives our everyday world today.

Palmtop PCs

It's another story for another time, but that 1980 TRS-80 Pocket Computer was actually a rebadged Sharp PC-1211, which itself was an amazing piece of engineering that pressed into service two four-bit CPUs and allowed users to code their own BASIC programs. Hewlett-Packard followed Tandy Electronics in 1982 with its HP-75, as did Psion in 1984 with the Organiser I. As portable computing devices of the time, they were fine for small simple programs... but not much else, let alone playing digital audio.

Continued improvements in CPU capabilities during the early '90s led to a new generation of 'Palmtop PCs', such as HP's little 95LX from 1991, plus others from Poqet and Sharp. These typically MSDOS-powered computers delivered dot-matrix screens, QWERTY keyboards and onboard software, making them more useful business tools — but still no audio. Most of these devices featured low-power 8086-class CPUs running at less than 10MHz, which is not enough to sustain data throughput for 16-bit sound.

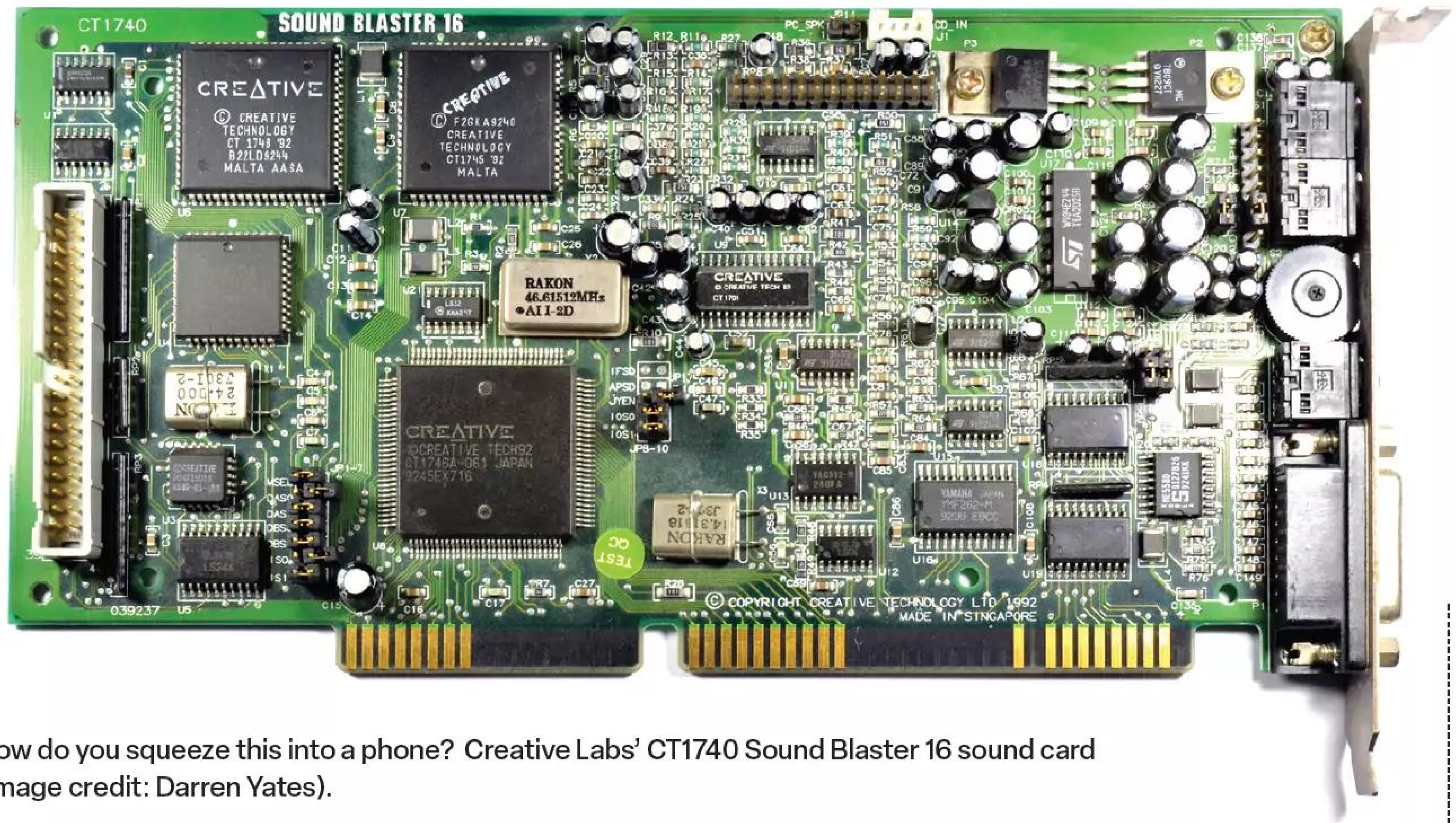
> Windows Media Player... you could now listen to music while taking notes or doing other things...

Toshiba Libretto

This lack of CPU processing power was a key roadblock in preventing early mobile devices from offering digital audio. The desktop PC was the first consumer-grade computing device to receive 16-bit stereo sound, thanks to the arrival of Creative Labs' Sound Blaster 16 ISA sound card in 1992. That year, chip makers Intel and AMD were still in the trenches over various iterations of the 80486 CPU — Intel's famed Pentium processor was still a year away.

However, squeezing existing audio technology into a mobile device was still very optional. For example, DOS-based laptops of the era, such as the IBM ThinkPad 350 from 1993, didn't include

More than 25 years on, Toshiba's Libretto is still one of the smallest PCs ever built (Image credit: Lorenzo Breda, CC BY-SA 3.0).



How do you squeeze this into a phone? Creative Labs' CT1740 Sound Blaster 16 sound card (Image credit: Darren Yates).

audio at all.

It wasn't until the impending launch of Microsoft's Windows 95 operating system that laptop manufacturers accepted the growing scope of multimedia and new laptops began routinely featuring a 3.5mm stereo headphone socket. Considering the original CT1740 Sound Blaster 16 card itself was around 22cm long, shrinking the technology to fit was a fair effort in its own right.

Nevertheless, the early '90s saw the emergence of the 'subnotebook' market, and one of the smallest notebook PCs ever seen in Australia appeared in 1996 in the form of the Toshiba Libretto 50CT. Combining an Intel Pentium-75 CPU and Windows 95 OS, the 50CT wasn't that much larger than many of today's big-screen phones, measuring just 210 x 115 x 34mm. Yet it featured an 810MB hard drive and a 2.5mm headphones socket capable of 16-bit stereo sound. Unfortunately, compressed audio playback options were limited (WinPlay3 was the only Windows app that could play MP3 files at that time), so the space-hungry Pulse-Coded Modulation (PCM) format was the only practical option until 1997. Nevertheless, it highlighted just how small the technology was becoming.

Microsoft's PocketPC

The year after the Libretto 50CT's arrival (and possibly in response to it), Microsoft launched its first mobile computing standard, dubbed the 'Handheld PC'. It also debuted a new mobile-focused operating system called Windows CE. Full-QWERTY keyboards and coloured LCD screens powered by new ARM-class CPUs also improved battery life considerably. HP's Jornada 720 was a fair example.

However, the Handheld PC still didn't take with the market. Nevertheless, Microsoft worked with hardware manufacturers and rebuilt the platform, ditching the QWERTY keys and borrowing the touchscreen concept from the Apple Newton (and more recently, the hugely successful PalmPilot).

The 'PocketPC', as it was dubbed, arrived in April 2000. PC maker Compaq was a key PocketPC partner, but the shock merger between Compaq and Hewlett-Packard in 2002 saw the Compaq brand retained for a short time, before being replaced with 'HP iPaq' branding. They were also affordable — my HP iPaq H1930 cost under $400 and came with the one piece of software I used more than any other.

Windows Media Player

It had been available for Windows operating systems going right back to Windows 3.1, but one of the most important apps for digital audio in general, and the PocketPC in particular, was Windows Media Player. The combination of external storage availability (typically CompactFlash or SecureDigital flash cards) and now onboard MP3 and WMA audio compression or 'codec' support meant that you could now listen to music while taking notes or doing other things on the device. The iPaq H1930 was my traveling oasis for a number of years — I could write story ideas as notes while listening to music on a device much smaller than a laptop, something I couldn't yet do with an iPod.

> The iPhone... the nexus of multiple technology strands all reaching sufficient maturity at the right time

In that regard, Windows Media Player helped create a complete shift in mindset. For more than 100 years, listening to music required a dedicated device. Now, it was just another app. Sure, Media Player wasn't the only app of its type (does anyone still use Winamp?), but it was all but guaranteed to appear on every PocketPC device. In this case, familiarity bred content.

But if there was a feature that tended to polarise users with most PocketPCs, it was the stylus-required touchscreen. The screen's touch technology was 'resistive', meaning it required considerable physical pressure to activate a particular spot. Since the screens were also pretty small (and on-screen keyboards even smaller), a stylus was the only real solution.

By comparison, a genuine 'touch' screen required a more sensitive 'capacitive' layer that used the capacitance effect of your finger against the screen's touch layer. This technology's day was still to come.

Sharp's PC-1211 was the first programmable computer that could fit into your pocket (Image credit: Denisfo, CC BY-SA 3.0).

The Apple iPhone — what was all the fuss about?!

What are we waiting for?

However, as the 2000s progressed, more of us were carrying more than one device in our pockets — you had a mobile ('feature') phone and your MP3 player. Increasingly, we were also using 'personal digital assistants' (PDAs), whether a PocketPC, PalmPilot or whatever. It had become obvious that the killer product would be an easy-to-use stylus-free PocketPC-style PDA that could play music and make phone calls. However, the barriers to overcome were substantial.

Limited battery power was one of them. Feature phones were everywhere, sure enough, but still required considerable electrical power to handle the phone's transceiver (transmitter/receiver) unit. Combining that into a 'smart' phone with CPU, storage, a screen and the rest would take skill.

Another issue was the availability of a suitable CPU. On the whole, single/limited-function devices like mobile phones and MP3 players utilised at best resource-limited and power-efficient microcontroller technology, rather than an expansive general-purpose, high-performance CPU. However, that is exactly what was now required — and in 2005, CPUs that delivered decent performance on a bare sniff of electrons were still pretty thin on the ground.

Nevertheless, chip designer ARM had cut its teeth on the Apple Newton and over the last 20 years had slowly built up its CPU technology portfolio. In 2005, the company announced the first of its new Cortex-A CPU family, dubbed the 'Cortex A8'. Apple instead chose a Samsung version of the previous-generation ARM11 CPU core. Apple also underclocked the chip from its standard 620MHz to 412MHz to reduce power consumption. However, today the ARM Cortex-A series rules the world.

By the time Apple boss Steve Jobs pulled the iPhone out of his jeans pocket on its announcement day of 9th January 2007, it was the nexus of multiple technology strands all reaching sufficient maturity at the right time — capacitive LCD panels, mobile CPU design, flash storage capacity, Lithium-ion battery technology, internet connectivity, RAM chip capacity, chip fabrication methods. All of these technologies had to reach just the right level to make the iPhone a practical reality.

Smartphones and earphones

Today, the combination of smartphone and wireless earbuds is the uniform of choice of travellers around the world, whether it's walking to work or hitting the bus, train or plane. Audio quality is all but indistinguishable from the original live instruments, and the idea of storing music locally on your device is 'so 2010s', particularly when streaming services can provide access to almost any song streamed via your phone network provider.

Like the MP3 player and Walkman before it, look at an original first-generation iPhone today and it too, with its tiny screen, has aged by today's standards. But in the 16 years since, not much has changed — phones are bigger, faster, run longer and do more, but the same basic building blocks are still there. Let's hope that in another 40 years, future generations look back at how primitive it all is.

What goes around...

That said, today's smartphones do make it ridiculously simple to dial up and play almost any song ever written. In losing much of the complexity of listening to our favourite music, though, we have also lost a fair bit of what I'd call the 'theatre' of playing recorded music. In much the same way the clash of rods and pistons and the steam of a steam train captures the imagination of young and old alike, there's a bit of magic and anticipation involved when you pull out an LP, reel of tape or cassette, load it into what now looks like some weird retro-electromechanical time machine, operate its controls and levers, watch it spin up and hear the dulcet tones of your favourite musicians emanate. But like the steam train, it's probably an idea that belongs to another time.

Over the last six issues, I've traced a potted history of portable audio — from the early days of luggable valve radios to carry-able reel-to-reel tape recorders, the invention of the compact cassette, the compact disc, flash storage, iPod and iPhone.

Yet in the face of this rapid cascade of new technology, there have been recent reports of younger generations discovering technologies of generations past, including cassettes and digital cameras. Brush it off as just a case of 'early-onset nostalgia' if you like, but I reckon there's an innate desire in all of us to understand more of our technology. Or at least to feel a little more in control of it.

Nevertheless, music helps us to react and feel, to forget and remember, as it has done since the dawn of time — and for 100 years come December, as we celebrate the centenary of broadcast radio in Australia, we've been using technology to do much the same.

The T-Mobile G1 (HTC Dream) launched Android to the world a year after the iPhone (Image credit: Michael Oryl, CC BY-SA 2.0).

Ucklander of my vintage, you will know The Loft, a popular store at the top of three flights of narrow stairs," he recalls. "That's where I learned to love jazz, and many of the artists I discovered back then are still my absolute favourites. I was still a school kid then with no money, so I didn't have a sound system — just my parent's radiogram — but I had ears, and they soaked up great music."

Fisher learned about audio designers while discovering Dave Brubeck and Miles Davis. The sound system in the shop was basic (he can't remember exactly what it was), but it had *something* — the character, nuance, balance and intimacy that made jazz records more engaging than the 'rock sound' of JBL and horn speakers.

"I revered the great German designer Dieter Rams," he says with relish. "What a smart mind!"

Dieter created the products that made Braun Audio a famous brand. Fisher believes that Apple has clearly been heavily influenced by him, and claims the man's philosophy of design informs his own approach to most things today, including audio equipment.

"The essence of his philosophy is this: good design makes a product useful. Good design is aesthetic. Good design makes a product understandable. Good design is innovative. Good design is as little design as possible. That's

An audiophile path, well trodden

Writer Peter Xeni

Australian ad-man Tony Fisher was once a 'high flyer' working in The Big Apple. He's retired there now; the flying has stopped. He hates the term but he was 'big' in the New York advertising scene where he co-piloted campaigns for years. I contacted him at his brownstone habitat to which he retired after launching advertisements for Rupert Murdoch's Sky Channel in England and big brands in the States — though he still calls Australia home. He's relaxed now, and sometimes plays pool. Things have changed for him.

Fisher once owned a lot of hi-fi systems, and now he owns none. The lure of expensive cables and the snake oil products no longer appeal — but he still likes good sound.

"First things first, I'm not an audiophile," he tells me. "I used to be, but not anymore."

"I still value good sound, just not nearly as much as I value the emotional impact of music. That's why I have become almost exactly the opposite of an audiophile. I've had my years of equipment madness and revelling in the insanity, but thankfully that fever has now broken. I'm far less interested in the journey than the destination. Those infected by the audio bug may cease reading here, but many are experiencing my former hi-fi fatigue in their search for the Holy Grail. They're still climbing into Sigmund Freud's fairytale castle without questioning their sanity: 'I heard the [insert product name] and it made a huge difference, it was amazing'… the Holy Grail."

Tony's musical journey began in high school in Auckland, New Zealand. As a secondary student he worked part-time in a record store that specialized in jazz. It was a legendary magnet for the NZ jazz lovers, from both the South and the North Island.

"If you're an

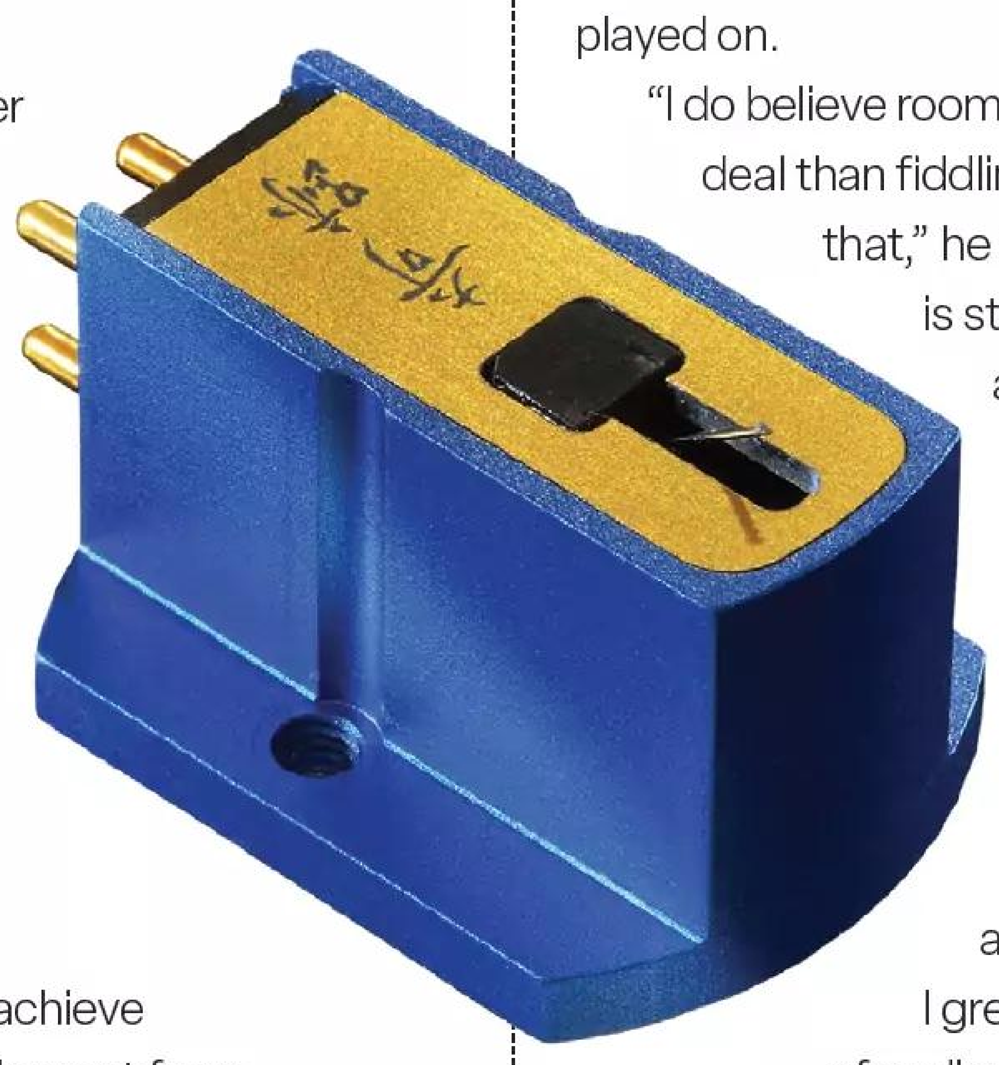
not what I see when I talk to most audiophiles," says Fisher. "It is quite the opposite. For many or most of them, complexity dominates. *That* is where the pleasure is. For me, it's quite the opposite. The past had its pleasures; the present has advantages that were unimaginable back then, but the aim is the same: engagement with music."

Fisher first bought a small Pioneer valve amplifier. "I wish I still had it," he says. "I can't remember the model, but I loved it. It was a little beauty. But I was seduced by transistors, so I sold it and bought some transistorized piece of rubbish. Live and learn! I won't bore you with all my subsequent mistakes, I'll just tell you about my peak system. By then I was living in New York, so almost everything was understandably American: Avalon Eclipse speakers, VAC monoblock valve amplifiers and preamp, and my beloved Michell Gyrodek turntable with a Fidelity Research tonearm and Kiseki Blue cartridge."

I asked him why he didn't buy the British turntable, a Linn Sondek. He stops and reflects. "Well, I have Rupert Murdoch to thank for that," he says. "I was living in London for several months, writing and producing advertising for the launch of his Sky television. The place had great sound; I was inspired. I walked into an excellent audio store and had the opportunity to hear a side-by-side comparison of the Gyrodek against a Sondek. I don't mean to offend Linn devotees, but for me it was no contest. I still have the Gyrodek, but since then the quality of my audio experience has all been downhill. Later on, I had many other more important things to concentrate on, not least raising two American-born children following the loss of my wife."

Indeed, in Fisher's life, personal matters overtook his interest in audio, which continued with various lesser systems.

"I do have an interesting memory of when I sold my equipment," recalls Fisher. "I remember feeling a sense of relief. It was as if I hadn't owned my equipment. Rather, that the equipment had owned me. It needed too much space, too much attention, too much fiddling. It loomed too large in my life."



His children are no longer children, and he is ready to invest in a new system, but "it will be nothing like I've had in the past," he says. "I'm not nostalgic about any of the equipment I once owed."

He believes that the experience of evaluating tiny differences between cables, or this valve versus that valve, or struggling to achieve compatibility between equipment from multiple manufacturers "is an itch that can never be fully scratched".

He appreciates that the process gives countless people enormous pleasure — he gets it — but he isn't one of them anymore. The new cable, the umpteenth upgrade for the Linn turntable... "that's not for me; I want simplicity and the advantages of modern technology," he says. "I don't seek perfection because I know there's no such thing. I simply want 'good enough', which means an emotionally immersive listening experience, and for me that doesn't mean elaborate or hugely expensive [kit]. Some of my most engaging listening has happened in my car — driving along a desert highway frees the mind for the emotive impact of music, and not just its sound. I've rid myself of that bug. Before you rang, I was about to listen to music through my Grado headphones and MacBook. It doesn't get much simpler than that."

Mercedes-Benz got it right years ago, he says, when it was once run by engineers instead of marketing and sales people. They said the best technology was invisible.

"I feel the same way about audio equipment. I don't want to look at it, I just want to listen to music that moves me. Right now, I'm considering two modestly sized speakers and maybe a subwoofer, with a Lyngdorf fully digital, all-in-one amplifier with very advanced room correction. that is small, discreet and understated. Dieter Rams would approve!", he says.

In a sense, Fisher has returned to the jazz shop of his youth, where he discovered music but doesn't remember the equipment it was played on.

"I do believe room correction is a much bigger deal than fiddling around with this cable or that," he says. "I'm aware that digital is still a swear word for most audiophiles, even though the right kind of digital can indisputably compete with great analogue. But that seems like a collision between old and new thinking, and it's a discussion for another time. That said, I greatly enjoy the company of audiophiles and most certainly appreciate the friendships I've made via audio in Melbourne and everywhere I lived in my former busy life.

Fisher says he is more chilled now, more focused on 'just being' and not belonging. So whether it is New York or Melbourne, it's all the same to him.

"Life is complicated and I want simplicity wherever I can find it, especially in my music playback system," he says. "I guess the charm of this mad hobby is that we can each choose our path to the promised land. But whichever path we do take, it's a good idea to stay open to the new."

Bon Jovi

Forever

EMI

It was difficult not to notice that something was amiss when Bon Jovi played at Wembley Stadium in 2019. That something was Jon Bon Jovi's voice — top notes went awry, melody lines fell flat. Not always, but often enough to be unsettling. The girl next to me, who would have once forgiven Jon if he'd accidentally driven his motorbike into her as long as she'd got an autograph, suggested we leave before the end.

Jon, who doesn't talk much, and says even less when he does, has been surprisingly candid of late: 'Thank You, Goodnight: The Bon Jovi Story', a four-part documentary on Disney+, charts his journey to combat his atrophied vocal cord and the major surgery to fix it. As he told the UK's The Sunday Times recently: "If the singing is not great, if I can't be the guy I once was, then I'm done… I don't ever need to be the fat Elvis."

Time will tell how arena shows around the world will treat one of the best rock stars of the past few decades (argue among yourselves), but at least this latest album 'Forever' is pointing him and his band in the right direction again. After the woeful, and pretty much solo, 2020 record, 'Forever' sounds like a Bon Jovi album. Rock songs, power ballads: it's a big-sounding record designed to be played to big rooms. Admittedly it's no 'New Jersey', but that's like expecting to still fit into the T-shirt you bought on that late-80s tour. Time has moved on for all of us.

We Made It Look Easy, a thrumming Bon Jovi staple-type track, charts the band's rise from New Jersey clubs to stadia status, and has heartfelt appeal. Bon Jovi has an ear for a nagging hook, and this one is into you before the first chorus has even faded away. Ditto the bubbling *Living Proof*, with its familiar, if extraneous, talk-box guitar intro, and an iron-clad chorus that hits like a linebacker at full tilt. Especially good, and probably the best track here, is *Waves*, which has the hallmark Bon Jovi cues, acoustic guitars, reflective lyrics, and a rousing chorus that builds to a dizzying, raise-your-fist hook that will translate into any language live. As always, the Bon Jovi ballads — *Kiss The Bride* and *My First Guitar* — underwhelm, but once you get to *Living In Paradise*, which is one big chorus with some song parts bolted to it, you won't care; like Jon, you'll be racing forward to the future.

The Decemberists

As It Ever Was, So It Will Be Again

YABB/THIRTY TIGERS

You can't fault the restless ambition of The Decemberists' ringmaster and arch-conceptualist, Colin Meloy. The band's sixth studio album climaxes with a haunting, ominous, 20-minute prog epic complete with a musique concrète middle section. It's by far the most powerful piece of music they've ever made. The rest of the album is a mixed bag stuffed with a few too many generic mid-paced plodders based on borrowed folk/country melodies, but it's the scattered highlights you'll remember and return to. Meloy is a talented commercial songwriter at heart; check out the Sloop John B-indebted earworm *Burial Ground*, the sweetly sincere *All I Want Is You*, the neo-psychedelic *Born To The Morning*, and, best of all, *America Made Me*, an ironic, eccentric, anguished folk-pop bop in the classic The Decemberists mould.

Cage The Elephant

Neon Pill

RCA

The neon pill of the title track refers to the medication that left Elephant singer Matt Schultz suffering psychotic delusions for three years, leading to his 2023 arrest on gun-license charges, and months in hospital. That this sixth album, arriving five years after the Grammy-winning 'Social Cues', subtly explores this period while sounding so bright and kaleidoscopic is a miracle on par with his swift recovery. *Rainbow* is pure Technicolor lounge funk, the title track paints grandiose Gallic pop in luminescent tones, and *Float Into The Sky*, concerning psychotic isolation, is a gorgeous dream-pop drifter that sounds like an aurora borealis afterglow. There's a minor Beck rap dip on *Ball And Chain* and *Good Time*, but the psych-Strokes momentum of *Metaverse* and *Silent Picture* keeps matters nimble, and here be some of the year's most uplifting choruses. Brilliantly bright-side.

Mammal

The Penny Drop

INDEPENDENT

Funk-rock is not the most obvious conduit for political discourse, which is presumably one of the many reasons Red Hot Chili Peppers are such crashing lyrical bores. And yet Aussie band Mammal have combined a surf-bum look, beer-chugging groove and party atmosphere with calls for freedom of speech, social justice and fighting the forces of fascism. The musically darker *Doubt* — a sweeping, despairing stadium rocker — stands in sharp contrast to a daft song titled *Keanu Reeves*. Quite the mixed bag, then, but the energy and enthusiasm never flag for a second, with scatter-gun riffs exploding over fuzzed-up rock'n'roll to keep the adrenalin pumping. 'The Penny Drop' presents rebellion as the most fun you can have while making a difference in society, making Mammal a Rage Against The Machine you would actually want to go to the pub with.

Crowded House

Gravity Stairs

BMG

Since the sad loss of the band's original drummer Paul Hester in 2005, nearly all of Crowded House's albums have required a patient ear — and 'Gravity Stairs' is no exception. Gone (for the most part) are the familiar pop hooks that dominated those early records, exchanged for more thoughtful, complicated arrangements as frontman Neil Finn contemplates his own mortality. Dreamy opener *Magic Piano* drives this particular thought as he imagines hiking up his own stairway to heaven, while pianos play by themselves and dark forces conjure suspicious shadows. The same downbeat approach also inhabits the melancholic *Some Greater Plan (For Claire)* and the comforting *Thirsty*. Thankfully the record isn't devoid of moments of joy, as the jaunty *Life's Imitation* and the wistful jangle of *The Howl* show flecks of the band's earlier years. No, 'Gravity Stairs' is not an easy listen, but it is one worth sticking with.

Music reviews continues on page 80 ▶

australian

hi-fi

MARKET PLACE

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2	Receive reliable personal advice	Bit of a lottery on the advice front	No advice
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P422
STEREO POWER AMPLIFIER

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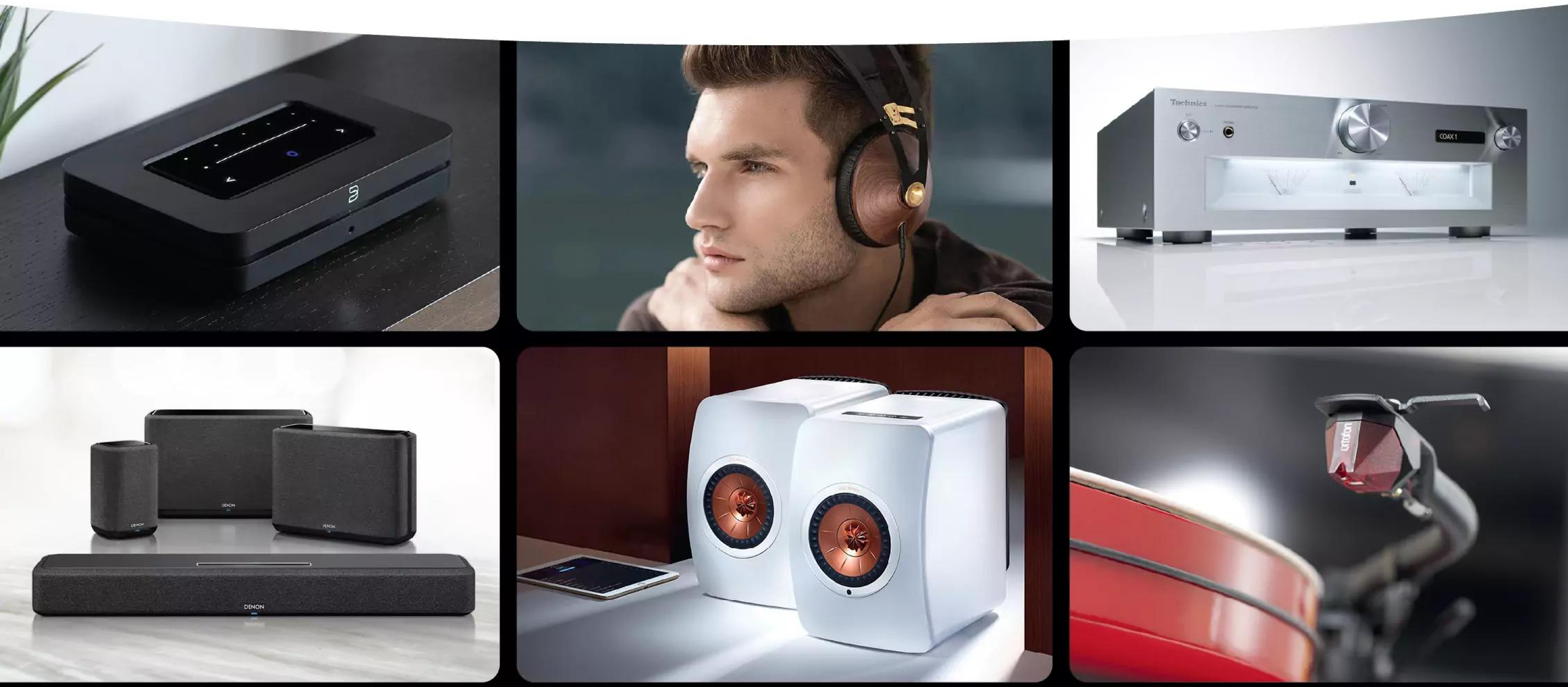

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10 top tracks to test your headphones

Naturally, there is personal preference in what you want from your headphones — no audiophile could be precious enough about their hobby to assume the success of brands such as Beats is reliant purely on good marketing. But by and large, there is no reason you ought to expect a radically different level of performance to that of your system's amplifier and speakers.

You may already have your own playlist to test equipment before you buy it — if not, it is a worthwhile exercise — but here we present to you tracks that will highlight what is widely believed to be the most important aspects of headphone performance.

Havergal Brian
Symphony No1 in D Minor (The Gothic)

To test detail levels

It's rare a product is criticised for lack of detail alone, but when you hear something particularly insightful it can really make a difference. The term itself is pretty self-explanatory: it's about digging deep into what is being performed, rather than how. Large-scale orchestral pieces, with a grand range of instruments and timbres, will highlight just how much insight is being delivered. This particular symphony, written by Havergal Brian, is a veritable behemoth, spanning the piccolo to the timpani via two harps and a children's choir. Live recordings are another decent test: hand-claps are one of the more difficult sounds for equipment to reproduce.

Kate Bush
Watching You Without Me

To test dynamic subtlety

Really, this Kate Bush masterclass in songwriting, delivery and production can tell you most of what you should know about your headphones — their ability to time, capture midrange detail and, ultimately, track the subtlest of dynamic fluctuations. It's a great overall test track that deserves a spot on any such list as this. The reciprocating synths, metronomic drums and bent pizzicato double bass notes interlink to create a delicately textured rhythmic gauze ideal for testing your headphones' timing and rhythmic knack. But it's the dynamics of this track that are truly illuminating, with acres of reverberant space

and tonal shade as Kate Bush switches between soft crooning, softer whispers and murmured 'secret messages' with words sung backwards.

BadBadNotGood
Speaking Gently

To test rhythm and timing

Anyone who was ever in a school band will know how infuriating it is to play with somebody who can't keep time — if you didn't know that, it was probably you. The same goes for hi-fi, and your headphones should be able to make sense of polyrhythm just as adeptly as they lock into a rigid 4/4. This particular track from BadBadNotGood's album 'IV' offers a simple, solid beat as it opens, before sprawling into a freer percussive mindset. Timing also feeds into how instruments interact, how they question each other and then answer. If the performance sounds loose, disorganised or dull, it is probably down to poor timekeeping.

John Martyn
Small Hours

To test spaciousness

Space may appear a peculiar concept when it comes to sounds being played directly into your ears, but a claustrophobic performance can be the enemy of deeper listening. You don't want instruments to sound detached from one another, but each line should have space to breathe. Live performances are a good test as to whether your headphones are able to judge the size of an auditorium — or you can go a step further with this album closer from John Martyn. It was recorded outside, so there is no excuse for Martyn's guitar to sound at all boxed in.

Arvo Pärt
Tabula Rasa

To test dynamic range

As good as your four-year-old nephew may be at playing the recorder, you probably don't want your headphones to play like they're at a school assembly. A dearth of dynamic range will give you a flat performance, sometimes sounding almost like a rehearsal, undermining any emotion on the original recording. Pick a piece where small- and large-scale dynamics fluctuate as they do here, and you'll hear whether your headphones are up to the job. It's often the smaller-scale dynamics that make the greatest impression: those are what will give voices their expression, which will be especially important if you use your headphones for watching films and TV as well.

Darkside
Paper Trails

To test bass control

Some manufacturers tend to skew their products' balance toward the bottom end, which we understand suits a certain section of the market. But if that's what you like, it is perhaps even more important those bass frequencies are articulate and suitably agile. It isn't enough for your headphones to make your earlobes wobble if you can't actually hear what's going on down there. A track with a moving bassline will either drive or confuse a performance, depending on the aptitude of your kit. Darkside's *Paper Trails* has the added benefit of testing a vocal line deep into the frequency range, which will really highlight the clarity of the bass — or lack thereof.

Pharoah Sanders
You've Got To Have Freedom

To test treble quality

Coarseness in treble frequencies is probably one of the first things you'll notice in headphones because it will make your ears hurt. If that's happening once you've given your headphones a day or two to run in, you'll end up wanting to bin them altogether. But sometimes it can go the other way — perhaps in an attempt to rid a performance of any sharpness, manufacturers will roll the frequency range off at the top end. Either way, you aren't getting the rich treble frequencies you and your ears deserve. This particular track from Pharoah Sanders finds his saxophone in full-on attack mode. Without making your ears bleed, it ought to sound like a mother goose being prodded with a knitting needle, and you should accept nothing less.

Ólafur Arnalds
Ljósið

To test subtlety

Getting you out the door and enthused for your run is one thing, but if you use your headphones for anything else then a little subtlety and restraint will be as important as that drive. This Ólafur Arnalds piece, from his album 'Found Songs', is a lesson in refinement, with piano keys wanting to be stroked rather than hammered, violin weeping rather than amid a full-on gin-sob. If your headphones can render this as well as they do Black Sabbath, it will really pay off in the subdued moments of tracks before they end up letting fly.

Crosby, Stills, Nash & Young
Helplessly Hoping

To test midrange quality

By and large, the midrange is where you will find your vocal lines. Pretty important, then. Clarity is, of course, a primary concern, as are stability and warmth. If there isn't enough midrange support from lower frequencies, vocals can sound thin and lack human quality. Finding a track with a clear, prominent vocal line is all you need do, but it's even better if it includes such vocal harmonies as those so consistently delivered by Crosby, Stills, Nash & Young. *Helplessly Hoping* is a prime example, and your headphones should have the midrange detail and roominess to capture the lusciousness and layering of the harmonies while keeping a hand on the melodic strumming beneath. You certainly shouldn't feel as though you're helplessly hoping for more insight.

Explosions In The Sky
Wilderness

To test overall balance

Balance isn't always an easy one for headphone manufacturers to get right. Quite often we find them overloading the bottom end in an overzealous attempt to keep their product from sounding lightweight or rolling off the treble to avoid any sharpness nearer the top of the frequency range. In order to test the overall balance, you want a track that covers as much of the frequency range as possible. You'll get that from a lot of orchestral works, but more contemporary pieces can work as well, such as this from Explosions In The Sky. There's plenty of low-end heft in *Wilderness*'s percussive pulse, while some of those guitar harmonics will reach high into the treble frequencies. Prefer something jazzier? We can't recommend Black Country, New Road's *Instrumental* enough for the purpose of testing overall balance (and, of course, just purely enjoying).

David Bowie

David Bowie: Rock 'N' Roll Star! PARLOPHONE

For punk-presaging impact and shapeshifting socio-cultural resonance, 'The Rise And Fall Of Ziggy Stardust And The Spiders From Mars' felt like the first truly significant rock album of the seismic 70s, precipitating David Bowie manifesting as the first modern superstar.

It has taken 52 years for the album to get its boxset, and the glittering gold mine of previously unheard song doodles, demos and outtakes doesn't disappoint. From February 1971's hotel-room sketch *So Long 60s* prototyping *Moonage Daydream*, to the landmark Top Of The Pops performance of *Starman* 18 months later, this five-CD and Blu-ray disc set feels more like a heavyweight set of bonus tracks (29 previously unreleased) than the standard 'reissue plus outtakes'.

The set's fairly haphazard programming illustrates how Ziggy's lift-off was not a clean trajectory, December 1971's 'Hunky Dory' almost getting in the way of the new monster unleashed live the following month, not selling immediately. Sleevenotes confirm the uproarious crowd reaction to Bowie's debut at this writer's local Friars Aylesbury club in September 1971, providing the confidence-boosting impetus to reinvent himself (as he told this writer after raising the club's roof with Velvet Underground and Chuck Berry covers). Watching Bowie visibly transform from shy folkie into preening rock star suggests this landmark gig (a YouTube fave) would be more pertinent than CD4's non-Ziggy tracks from October 1972's Boston show. Four months later, he unveiled Ziggy Stardust at the same venue.

Bowie's subsequent dilemma of riding two very different records is illustrated by radio broadcasts from the limbo months between revealing Ziggy and that album's June 1972 release, all new material apart from Hunky Dory's *Queen Bitch*.

As shown here, Ziggy Stardust's final track listing constantly evolved until replacing *Around And Around* with *Starman* added the vital hit single. Earlier inclusions pruned for falling outside the emerging concept include *Velvet Goldmine*, *Sweet Head* and haunting *Shadow Man*. Alternative versions include a deeper-voiced *Lady Stardust* (a 'Hunky Dory' outtake).

Ultimately still mesmerising, enhanced by photos and memorabilia-stacked book plus 36-page reproduction of Bowie's notebooks, the boxset provides a suitably chaotic time capsule of a magical period now bathed in extraordinary poignancy.

AC/DC

Reissues

Any more for any more? That would be a resounding "Yes". So here we have the second wave of AC/DC-at-50 reissues, plugging some of the gaps in the first wave — and leaving a few for a third. Here are six slabs of limited-edition gold vinyl with exclusive art inserts, sleevenotes and custom labels, led very much from the front by a couple of stone-cold classics in the shape of 'Let There Be Rock' and buzzing live album 'If You Want Blood, You've Got It'. Nasty, heavy and wantonly raw, Bon Scott delivering some of his very best street-smart smut, the former is simply electrifying, featuring songs that very much still define the band. Drop the stylus anywhere on the latter and you'll hit a classic riff: *Riff Raff*, *Problem Child*, *Rock 'N' Roll Damnation* and, of course, *Whole Lotta Rosie*. 'Jailbreak' gathers up five tracks from the early Aussie-only albums, with the title track and *Soul Stripper* the obvious highlights. And then, once again jumping around the Brian Johnson era, we have 'Ballbreaker', 'Stiff Upper Lip', and 'Rock Or Bust', which, the first with Stevie Young on rhythm guitar, demonstrates that latter-day AC/DC definitely still have their fingers jammed in that high-voltage fuse box.

Pink Floyd

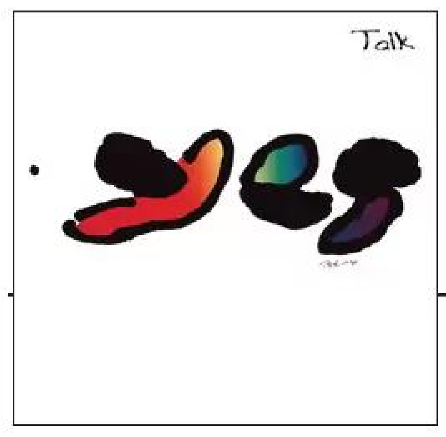
Animals PINK FLOYD MUSIC

It's one of rock history's greatest ironies that some of the prog dinosaurs that punk was out to destroy went significantly more noisy and anti-establishment in 1977. Such was the case with Pink Floyd's 'Animals', a new Dolby Atmos Mix of which has been repackaged here for Blu-ray (alongside the 2018 and original 1977 mixes), with striking new artwork. After the sumptuous ruminations on madness, war and music industry malpractice explored on 'The Dark Side Of The Moon' and 'Wish You Were Here', Roger Waters here concocted a metaphorical critique of capitalism and 70s society, based loosely on George Orwell's novel Animal Farm. His pigs represented despotic, self-righteous power figures — politicians, industry leaders, Mary Whitehouse; his dogs were savage and self-serving businessmen; his sheep were the deadheaded masses who ultimately rise up against their oppressors. Floyd may have been working in the medium of lengthy song cycles à la 'Atom Heart Mother' and 'Meddle', but they were singing from the same song sheet as the Sex Pistols. These dinosaurs had teeth.

Rival Sons

Head Down SACRED TONGUE

In the past 15 years, what has set Rival Sons apart from their peers is that they're an odyssey and a rock band in equal parts. They've been able to finesse their sound on each album — all eight capture a distinct vibe, while many acts struggle to evolve within the classic/retro-rock spectrum. Frontman Jay Buchanan has commented on this reissue, talking up the cinematic qualities of 'Head Down' and acknowledging it as an origin story for what followed. None more so than the sprawling 'Manifest Destiny' duology. The band have always been well mixed, but this remaster yields even more electricity. *Jordan* is a dreamy, mid-album mirage, *All The Way* the sassiest song in their history, and *Three Fingers* somehow wild and chic at the same time, thanks mainly to Michael Miley's feral drumming. Buchanan has the rock'n'roll shaman thing cracked these days, but *Keep On Swinging* still feels like his true introduction as a world-class voice. 'Head Down' was ground zero for the huge hype chucked towards Rival Sons, and they rose to the occasion by crafting arguably the most compelling catalogue in rock this millennium.



Yes

Talk (30th Anniversary) SPIRIT OF UNICORN

It might have been the end of guitarist Trevor Rabin's time in Yes (unless you count the Hall Of Fame appearance), but his piece of the Yes legacy — '90125', 'Big Generator' and 'Talk' — sound as pristine today as they did in their 80s and 90s heyday. Especially the latter now that it's been given a digital makeover, and reissued with two discs of live shows.

It's understandable, though, that Yes post-'Union', with a multitude of managers, labels and firing and hirings, makes the extended band sound as unsettled and vengeful as the Borgias, but less well put together. The excellent sleevenotes by Prog editor Jerry Ewing make you realise what a sorry mess the band and the industry were at that time. As brilliant and bestselling as the previous decade's *Owner Of A Lonely Heart* single was, it had cast the band in a new mould for a new era that music execs were keen to capitalise on. But what a fist Trevor Rabin and Jon Anderson made of their third album together, bookending it with the cursory pop single *The Calling* and the sprawling *Endless Dream*.

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